

MOBILITY ✓
ARTILLERY ✓
SPA (AF self propelled artillery) ✓

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TOWED

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MOBILITY PERFORMANCE OF TOWED AND SELF-
PROPELLED ARTILLERY AND RELATED VEHICLES

DONALD D. RANDOLPH, ET AL

U.S. ARMY ENGINEER WATERWAYS EXPERIMENT STATION
VICKSBURG, MISSISSIPPI

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MOBILITY PERFORMANCE OF TOWED AND SELF-PROPELLED ARTILLERY AND RELATED VEHICLES

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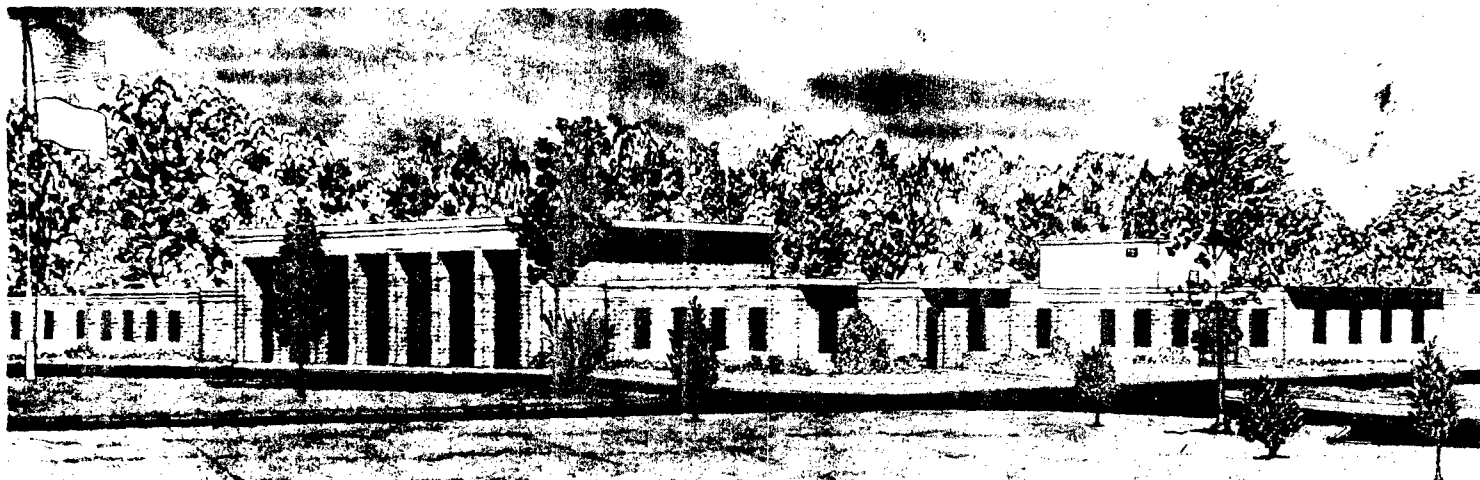
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January 1977

Final Report

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<p>This study establishes a mobility performance prediction data base for towed and self-propelled artillery and related vehicles for several terrain and weather conditions using the Army mobility model (AMM) and a simple model for making GO/NOGO predictions termed the JIFFY mobility model. Performance predictions are in terms of (a) percentage of a country with a given "probability of GO"; (b) speed profile and statistical diagnostics for primary roads, secondary roads, trails, and off-road;</p> <p>(Continued)</p>		

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20. ABSTRACT (Continued)

(c) performance index; (d) average speed for supply network; (e) selected mobility level rating speed; (f) vehicle group performance; and (g) time to complete special artillery missions.

This study does not attempt to analyze the mobility performance predictions data base, but does suggest methods or parameters which are considered as best for comparing the relative mobility of (a) the prime movers, (b) the prime mover-towed artillery and self-propelled artillery, and (c) group performance of selected vehicles.

Appendix A describes the JIFFY mobility model; Appendix B presents the vehicle characteristics; Appendix C includes the results of experimental vehicle dynamics tests; Appendix D describes the generalized terrain data; Appendix E contains the basic performance data for HIMO West Germany and Mid-east study areas; Appendix F discusses the selection of tactical high as the suggested mobility level for comparing study vehicles; Appendix G shows the computation of mission-oriented speed based on statistical mission definition and vehicle performance statistics for an area and condition.

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PREFACE

Personnel of the U. S. Army Engineer Waterways Experiment Station (WES) conducted the study described herein during the period December 1975-July 1976 for the U. S. Army Training and Doctrine Command (TRADOC) under Intra-Army Order for Reimbursable Services No. CD-81-76, dated 19 December 1975 and Change Order No. C1, dated 10 June 1976.

The study was conducted under the general supervision of Messrs. W. G. Shockley, Chief, Mobility and Environmental Systems Laboratory (MESL), A. A. Rula, Chief, Mobility Systems Division (MSD), C. J. Nuttall, Jr., Chief, Mobility Research and Methodology Branch (MRMB), and Mr. E. S. Rush, Mobility Investigations Branch (MIB). Messrs. D. D. Randolph, MRMB, and J. H. Robinson, MIB, directed the overall study and prepared this report. Messrs. Robinson, J. N. Peacock, L. M. Lewis, and S. M. Hodge of MIB, and Mr. B. G. Palmertree, Instrumentation Services Division, Operations Branch, WES, conducted the dynamics test program at Fort Sill, Oklahoma. Mr. R. G. Temple, MRMB, prepared artillery route network maps from job overlay maps, and Mr. C. D. Currie, MIB, digitized the route network maps for computer use. Messrs. R. P. Smith, B. R. Wright, and R. B. Ahlvin, Data Handling Branch (DHB), MSD, prepared the vehicle performance predictions for this study. Messrs. Temple, Peacock, and Currie, and Mrs. S. B. Anglin (DHB) assembled the vehicle characteristics data and prepared the data tables. Personnel of the Science and Technology Division, U. S. Army Tank-Automotive Research and Development Command (TARADCOM), exercised the Army mobility model (AMM) to predict vehicle performance in linear terrain. Supporting activities of TARADCOM were under the direction of Dr. J. G. Parks, Chief, Engineering Sciences Division, and Mr. Z. J. Janosi, Chief, Methodology Function Directorate.

COL G. H. Hilt, CE, and COL J. L. Cannon, CE, were Directors of WES during the conduct of the study and preparation of the report. Mr. F. R. Brown was Technical Director.

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CONVERSION FACTORS, METRIC (SI) TO U. S. CUSTOMARY AND
U. S. CUSTOMARY TO METRIC (SI) UNITS OF MEASUREMENT

Units of measurement used in this report can be converted as follows:

<u>Multiply</u>	<u>By</u>	<u>To obtain</u>
<u>Metric (SI) to U. S. Customary</u>		
millimetres	0.03937007	inches
square kilometres	0.3861	square miles (U. S. statute)
<u>U. S. Customary to Metric (SI)</u>		
inches	0.0254	metres
feet	0.3048	metres
miles (U. S. statute)	1.609344	kilometres
square inches	6.4516×10^{-4}	square metres
pounds (force)	4.448222	newtons
kips (force)	4448.222	newtons
tons (force)	8896.444	newtons
pounds per square inch	6.894757	kilopascals
miles (U. S. statute) per hour	1.609344	kilometres per hour
degrees (angular)	0.01745329	radians
horsepower per ton	83.82	watts per kilonewton

MOBILITY PERFORMANCE OF TOWED AND SELF-PROPELLED
ARTILLERY AND RELATED VEHICLES

PART I: INTRODUCTION

Background

1. As part of Force Artillery Mix-1976 (FAM-76), the U. S. Army Engineer Waterways Experiment Station (WES) conducted a study in 1972 for the U. S. Army Combat Development Command Field Artillery Agency (USACDFAA). In this study WES used the Army mobility model AMC-71¹ to determine the on- and off-road mobility performances of a group of self-propelled artillery and prime mover-towed artillery combinations, with generalized and detailed terrain descriptions representing a variety of operational environments.

2. As a result of recent development in applying mobility methodology to and analyzing detailed terrain data from two study areas in the U. S. Army Training and Doctrine Command (TRADOC) study "Special Analysis of High-Mobility Vehicles" (short title, "HIMO Study")² and related studies, TRADOC asked WES to conduct similar mobility determinations in support of another study, LEGAL MIX V. For this study, WES used the updated Army mobility model, AMC-74X^{2,3,4} and the terrain data base developed for the HIMO Study to determine performances of self-propelled artillery, prime mover-towed artillery combinations, and other artillery support and reference vehicles. In addition, a simple model to make GO/NOGO predictions termed the "JIFFY mobility model"* was also used to make predictions for nine countries in which terrain was described with less detail than the HIMO data base. The JIFFY mobility model was designed for use with terrain data described in less detail than required for AMC-74X. The AMC-74X was not used to make predictions for the generalized terrain data because the terrain was not described in sufficient detail.

* Described in Appendix A.

Objective of LEGAL MIX V Study

3. The objective of the LEGAL MIX V Study is to evaluate the relative effectiveness of current and projected towed and self-propelled artillery and of various mixes in specific artillery missions and operational environments.

Objective of WES Support

4. The objective of the WES support was to provide specific predictions of on- and off-road mobility performances of various study vehicles, i.e. self-propelled artillery, prime mover-towed artillery combinations, and other related vehicles in selected terrains or road combinations, and use these mobility predictions as a data base to suggest methods for analyzing the relative mobility effectiveness of candidate vehicles.

Scope

5. The scope of activities necessary to achieve the study objective were:

- a. The JIFFY mobility model (Appendix A) was used to predict the probability of off-road GO performances of 60 study vehicles in 9 countries described by generalized terrain data (Part III).
- b. The AMC-74X mobility model (AMM) (paragraph 20) and HIMO methodology were used to predict off-road and on-road performances of 13 selected study vehicles in the HIMO West Germany and Mid-East study areas described by detailed terrain data. Performance predictions in each study area included the following:
 - (1) Speed profiles for primary roads, secondary roads, trails, and off-road and related indices (V_{90} , V_{100} , percent NOGO) (Part III).
 - (2) Diagnostic statistics for primary roads, secondary roads, trails, and off-road (Part III).
 - (3) Link statistics for "as-is" and off-road links (Part IV).

- (4) Ranking of vehicles for tactical high and tactical high-high missions (Part IV).
- (5) Relative ranking of selected groups of vehicles (Part IV).
- (6) Time to complete selected artillery-related missions in West Germany (Part IV).

Items 1, 2, 4, and 5 were developed using the same representative sample of the terrain for the two HIMO study areas as used in the HIMO analyses. The West Germany sample terrain contained 16 percent of the study area and the Mid-East sample terrain contained 13 percent of the study area.

- c. A limited number of experimental ride and shock tests were conducted to establish ride dynamics relations for some of the study vehicles.

Composition of Report

6. This report contains a main text and 8 appendices: Appendix A describes the JIFFY mobility model, Appendix B presents the vehicle characteristics used in this study, Appendix C includes the results of experimental vehicle dynamic tests, Appendix D describes the generalized terrain data, Appendix E contains the basic performance data for HIMO West Germany and Mid-East study areas, Appendix F discusses the selection of tactical high as suggested mobility level for comparing study vehicles, Appendix G shows the computation of mission-oriented speed based on statistical mission definition and vehicle performance statistics for a given area and condition.

PART II: DESCRIPTION OF VEHICLES, TERRAIN DATA,
AND SEASONAL CONDITIONS USED IN THIS STUDY

Vehicles

7. Sixty study vehicles were selected by the LEGAL MIX V Study Group, 47 prime mover-towed artillery combinations, 3 self-propelled artillery, and 10 reference vehicles. A list of the study vehicles is given in Table 1.

Vehicle characteristics

8. All study vehicles were characterized as carrying their rated payloads. Principal characteristics of all of the study vehicles are listed in Table 2. Vehicle data as required for input to the AMM and JIFFY mobility model are given in Appendix B.

Ride and shock tests

9. Both field experience and simulations have shown that dynamic responses of vehicles traversing rough terrain and crossing minor obstacles often significantly influence speed. AMM is so structured that values for these critical vehicle characteristics can be obtained by simulations or from experimental data.

10. Experimental ride and shock data were available from previous test programs⁵ for most of the prime movers, but not for the towed artillery. Therefore, a test program was conducted to determine if the towing of an artillery piece by a prime mover would result in significant changes in the ride and shock responses of the prime mover, and to fill the voids in the existing data base. Also, data were collected for two self-propelled artillery vehicles. The results of these tests are presented in Appendix C.

11. It was concluded from this spot-check test program that the towed artillery had no significant effect on the vertical ride and shock characteristics of the prime movers at the driver's station. These characteristics are important inputs to the mobility model. It was also noted that additional limits to those used limiting performance due to ride and shock responses might be required to protect tires and rims

of the towed artillery from physical damage. The limited scope of this test program did not produce sufficient data to define such additional limits, however, and none were used in evaluations made in the mobility model.

Terrain and Seasonal Conditions

Terrain

12. Generalized terrain data for nine countries and detailed terrain data for portions of two countries were used in this study.

13. Generalized terrain. The generalized terrain data were prepared from maps with scales ranging from 1:825,000 to 1:3,200,000 and other limited data. Because the maps are classified, the countries are referred to herein as countries A, B, C, D, E, F, G, H, and I. These countries are identified in Reference 6. The generalized terrain data use 5 parameters (soil type, soil strength, slope, obstacle height, and vegetation stem size and spacing) to describe the off-road terrain (Appendix D). No linear terrain features or roads are described for the generalized terrain data base.

14. Detailed terrain. The detailed terrain data used in this study are for the HIMO West Germany and Mid-East study areas and were prepared from maps at a scale of 1:50,000. In the West Germany study area, predictions were made for a condition in which the terrain was uniformly covered with 10 in. of dry snow, which is a reasonably maximum average depth for the actual area. In the Mid-East study area, predictions were made for a condition in which the terrain was arbitrarily covered with clean sand common in sand dunes. These special terrain conditions are described in Reference 2.

15. Each HIMO study area contains about 3000 km².* The terrain descriptions include areal, linear, and road-network data; 22 factors describe a patch of areal terrain, 10 a segment of linear terrain, and

* A table of factors for converting metric (SI) units of measurements to U. S. customary units, and vice versa, is given on page 6.

8 a segment of road. The HIMO road-network data were derived by connecting the mission road and points (units and supply points or successive unit positions). Since this network was made up primarily of routes in connection with tactical support, the LEGAL MIX V Study Group selected a group of 37 missions within the West Germany HIMO study area related to artillery movement (identified as tactical movements 1-37 in Figure 1), and this network was used in this study. No routes were selected by the LEGAL MIX V Study Group for Mid-East terrain. The percentages of primary and secondary roads, trails, and off-road terrain in the HIMO and artillery routes in West Germany and the HIMO Mid-East routes are given in Table 3. This distribution shows that the artillery route network contains more trail and off-road travel than does the HIMO network in West Germany.

Seasonal weather conditions

16. Generalized terrain. Vehicle performance was predicted for the 9 countries for both wet and dry surface conditions using the soil strength associated with these two conditions (Appendix D). The wet condition is described as wet with associated reduced soil strengths but surface not considered to be slippery.

17. Detailed terrain. Vehicle performance was predicted for each HIMO study area for an excessive wet period and still raining, hereafter called wet condition. The wet condition for the detailed terrain data base is generally worse from the standpoint of vehicle mobility than the wet condition described for the generalized terrain because potential slipperiness of soil surfaces was considered in addition to reduced soil strengths due to high moisture contents of soil. During the wet condition, the soil surface of trails, primary roads, and secondary roads in the detailed terrain data base were considered to be slippery.

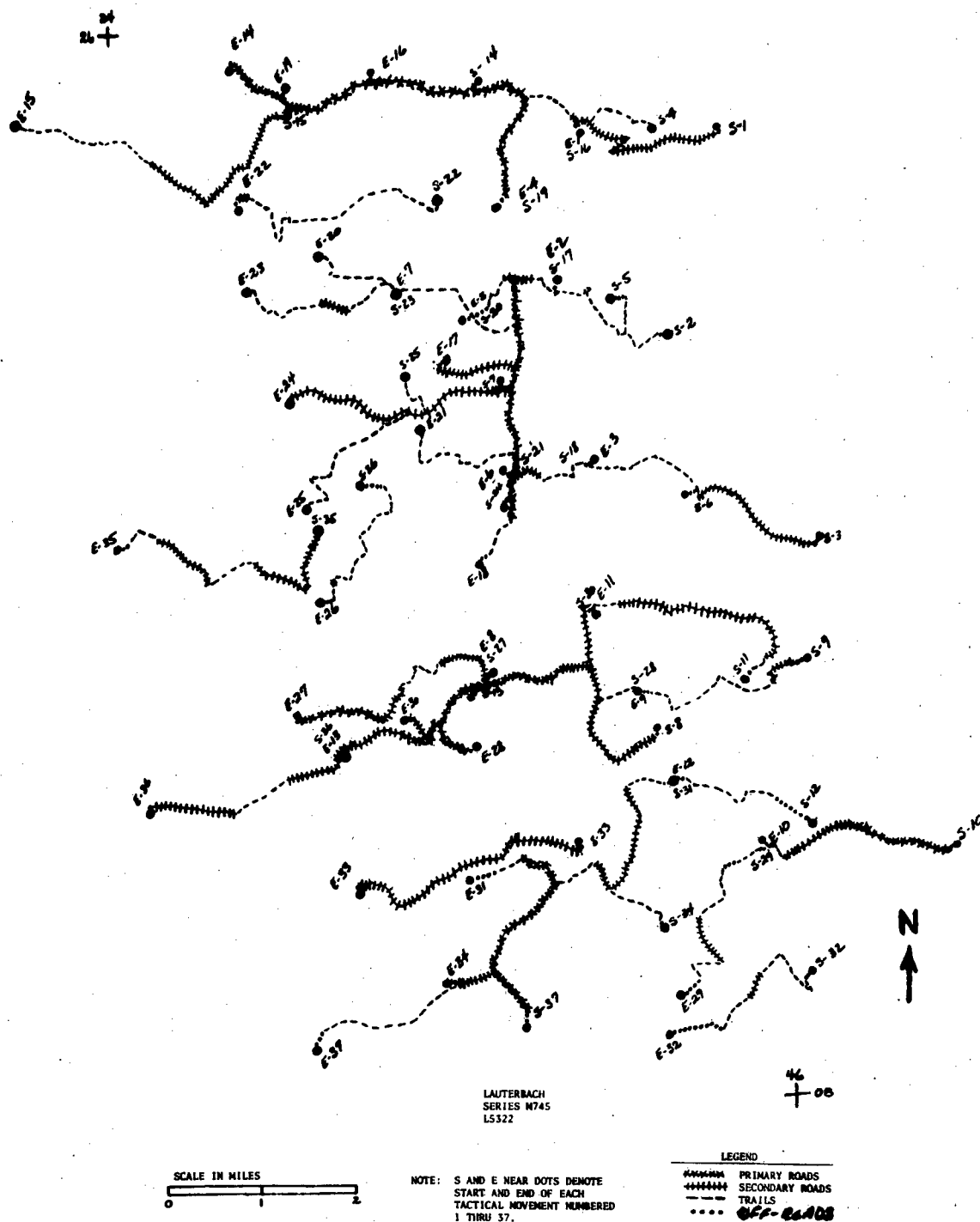


Figure 1. Mission network map

PART III: MOBILITY PREDICTIONS

18. The JIFFY mobility model (Appendix A) is a very simple model designed for use with generalized terrain data. It was used to predict GO/NOGO for all the study vehicles in the nine countries described by generalized terrain data.

19. The AMC mobility model (AMM) was used to predict on-road and off-road speed performance and time to cross linear terrain features for 43 selected study vehicles in the two HIMO areas and for selected artillery routes. The version of the AMM (AMC-74X) used in this study was the first-generation AMC-71 with a number of significant improvements in the predictive algorithms that have since been incorporated in the second-generation version (AMC-74) published in 1975. A brief description is given in Appendix A of Reference 2.

20. Most of the performance data for prime movers towing artillery are presented in the form of matrices to make it easy to compare the relative mobility of the candidate prime movers. The towed artillery were also grouped according to weight as follows: the 3340-lb M102 and the 4775-lb XM204 were referred to as lightweight artillery; the 12,700-lb M114A1, the 15,250-lb XM198, and the 16,590-lb XM(130-mm) were referred to as medium-weight artillery; and the 19,250-lb FH70 was designated heavyweight artillery.

21. To reduce cost, performance predictions over the detailed HIMO terrain and artillery routes were not made for 17 of the prime mover-towed artillery pieces, but performances of these 17 vehicles are referenced to similar prime mover-towed artillery combinations for which predictions were made.

22. Performance predictions for the study vehicles over the generalized terrain, the detailed terrain, and the special artillery routes are discussed in the following paragraphs.

Performance Predictions over Generalized Terrain

23. Since the generalized terrain data were prepared from small-scale maps and other limited available data (paragraph 12), quantitative terrain factors were mapped in broad class intervals. In the basic GO/NOGO predictions from the JIFFY mobility model (Appendix A), the mid-class value could be used as most representative of each terrain factor. However, endless possibilities exist, within the original description, for each value independently to lie at other points within the range, some of which may be more favorable for vehicle progress, others less so. Therefore, for this study GO/NOGO predictions were made with the JIFFY model for maximum, middle, and minimum values of soil, slope, and obstacle parameters (27 combinations) allowed by the class designators for each terrain unit (Appendix D). On the assumption that each of the three levels of each parameter had an equal likelihood of occurrence, and that the three parameters were independent, the total number of GO cases divided by the full 27 possibilities was taken as an expression of "probability of GO" for the given vehicle in a terrain unit.

24. For this study probabilities of GO were then grouped in three classes and assigned mobility levels as follows:

<u>Probability of GO</u>	<u>Mobility Level</u>
0-33	NOGO to marginal GO
>33-66	GO, but with some route selection required
>66-100	GO with relative freedom of movement

25. Probability of GO predictions were made for each of the study vehicles during the wet and dry conditions over each of the countries described by generalized terrain data. The percentage of each country that a given study vehicle could negotiate in that country at a given mobility level is given for each study vehicle in Tables 4 and 5.

Performance Predictions Over HIMO Detailed Terrain

26. Performance predictions for the HIMO detailed terrain data are described in the following paragraphs.

Speed profiles

27. A principal means of displaying area-wide off-road performance in areal terrain is an off-road speed profile. The off-road speed profile for a given vehicle, terrain, and seasonal weather condition shows the average speed the vehicle can sustain, as a function of the percentage of the total area under consideration that it avoids, under the assumption that it avoids areas posing the greatest impediment to its motion. AMM areal terrain speed predictions were run for all vehicles and two conditions (wet and snow conditions for West Germany and wet and sand conditions for the Mid-East) in the link traverse sample of the areal terrain characterized for one full topographic map sheet in each study area. The single map sheet selected for each area, covering 16 percent of the total West Germany study area and 13 percent of the Mid-East study area, is considered to be representative of the entire area and was the same sample used for the HIMO study. An example of an off-road profile derived from the AMM predictions is given in Figure 2.

28. The performances of the 43 selected study vehicles on primary roads, secondary roads, and trails can be displayed in speed profiles similar to the off-road speed profiles. Tables E1-E43 (Appendix E) list the speed profiles data in tabulated form (same as tabulated form shown in bottom right corner of Figure 2) for each of the study vehicles in the HIMO study areas for two selected conditions on primary roads, secondary roads, trails, and off-road.

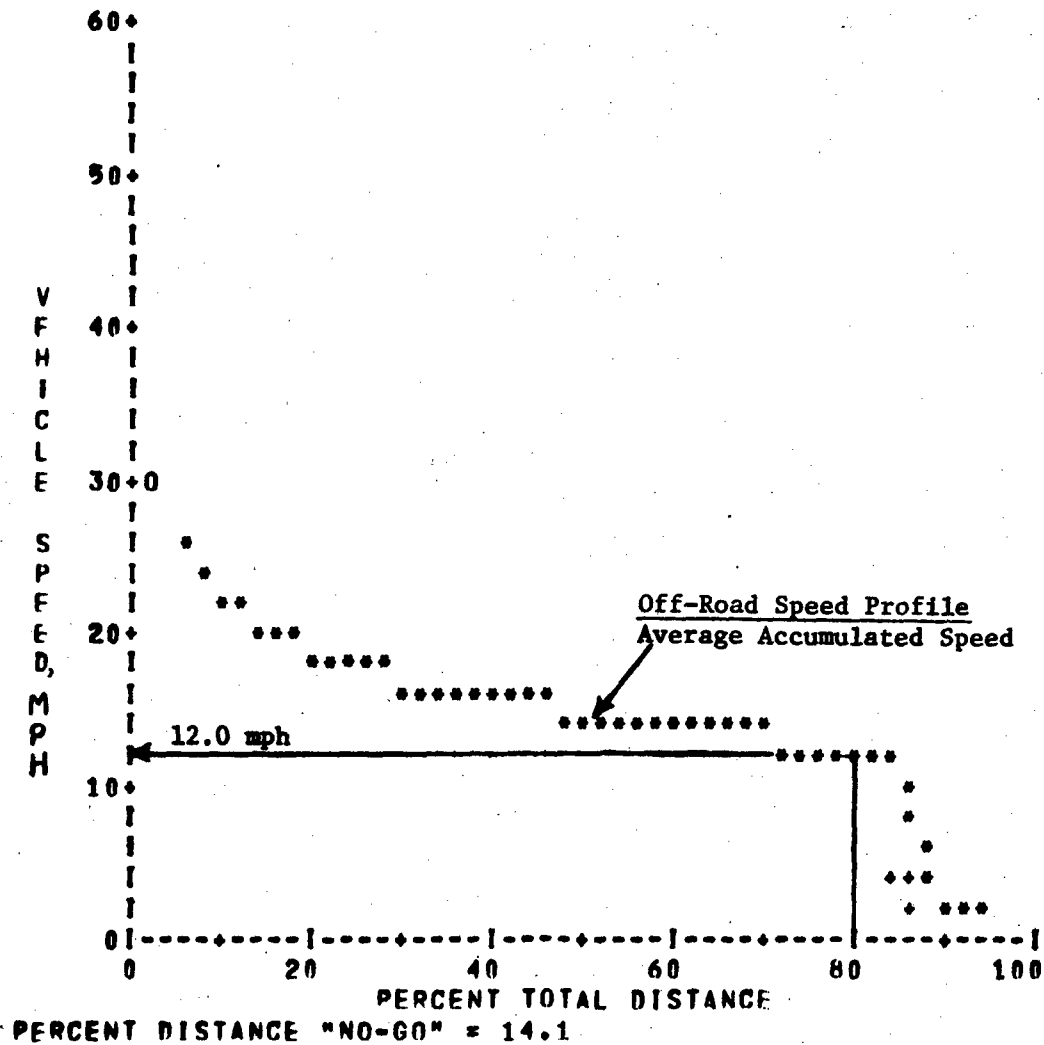
Performance indices

29. Four performance indices (V_{90} for off-road areal terrain and V_{100} for primary and secondary roads and trails) were derived directly from speed profiles. All were used to make discriminations in vehicle performance in the Department of the Army (DA) WHEELS Study.⁷ V_{90} is the average areal terrain speed when the vehicle is avoiding the 10

JORDAN

VEHICLE: M113A1

CONDITION WET



PERCENT TOTAL DISTANCE

	X=0	2	4	6	8
X	31.9	30.1	28.1	25.2	23.6
1X	22.3	21.5	20.9	20.0	19.3
2X	18.7	18.3	18.0	17.6	17.2
3X	16.9	16.6	16.3	16.1	15.8
4X	15.6	15.4	15.3	15.1	14.9
5X	14.7	14.6	14.4	14.3	14.1
6X	13.9	13.8	13.6	13.4	13.2
7X	13.0	12.8	12.6	12.4	12.2
8X	12.0	11.7	11.3	10.7	3.2
9X	1.9	1.4	1.1	0.9	0.8
10X	0.7				

ACCUMULATED SPEED

17

Figure 2. Off-Road speed profile data

percent of the areal terrains that is the most difficult. V_1 is the average speed (V_{100}) when the vehicle is traversing all primary roads, V_2 is the average speed when it is traversing all secondary roads, and V_3 is the average speed when it is traversing all trails. V_{90} speed for each study vehicle is given in Tables 6 and 7. V_1 , V_2 , and V_3 for each study vehicle is given in Tables 8 and 9.

30. Other indices that have been used to make discriminations in vehicle performance are "percent NOGO" for primary roads, secondary roads, trails, and off-road (DA WHEELS Study used "percent GO"). "Percent NOGO" for primary roads, secondary roads, and trails is given in Tables 10 and 11; and "Percent NOGO" for off-road is given in Tables 12 and 13.

Reasons for NOGO's or speed limits

31. Concurrent with the assembly of the speed profiles, the data were analyzed to obtain diagnostic statistics that show the relative occurrence of reasons for NOGO's and the factors limiting speed in the GO situations. Also included in these statistics is the average speed of the vehicle when controlled by a given factor. Tables E44-E87 (Appendix E) give the diagnostic statistics for the study vehicles for two selected conditions in the HIMO study areas. These diagnostic data characterize the two areas in terms of the type of mobility problems posed, as well as indicate for specific vehicles the design areas in which changes might benefit performance.

Link predictions

32. When predictions were made for the composite route network of all roads and trails in the study area, plus such off-road traverses as might be required for mission completion under reasonably favorable combat conditions (0.1 percent off-road in the West Germany study area; 1.1 percent in the Mid-East study area), the predictions were referred to as the "as-is link predictions." When all links are treated as off-road traverses, the route network becomes a substantial scenario-oriented sample of all off-road areal and linear terrain throughout the study area and is referred to as "off-road link predictions."

33. As-is and off-road predictions of average speed over all links

were made for each of the study vehicles for two selected conditions in both of the HIMO West German and Mid-East study areas. These link speed prediction data are given in Tables 14 and 15. The percentages of the total time for traversing links that the vehicles spent crossing linear features are given in Tables 16 and 17.

Tactical mobility levels rating speeds

34. The link prediction data and the methodology described in the HIMO report were used to obtain the performance of the study vehicles at the high and high-high (see Table 18 for definition of "high-high") mobility levels. These data are given in Tables 19 and 20. Tactical mobility levels are discussed in more detail in paragraphs 45 and 46.

Vehicle group performance

35. Self-propelled artillery and prime mover-towed artillery are often accompanied by other vehicles. When artillery and other vehicles travel together, the speed of the slowest vehicle in each terrain patch crossed will control the overall group speed in that patch. Since the same vehicle is not always the slowest vehicle in every patch, the vehicle group speed for a complete traverse through a study area will in general be slower than that of any one of the vehicles singly. On roads (but not trails), limiting speeds are largely determined by vehicle power levels, so that in road operations the speed of a mixed vehicle group will be very close to that of the slowest vehicle in the group.

36. Four vehicle groups were selected by LEGAL MIX V Study Group as representative of the types of vehicle groups as follows:

<u>Group</u>	<u>Self-Propelled, Prime Mover-Towed Artillery, and Accompanying Vehicles</u>
I	M109A1, M548E1, M577A1
II	M813-XM198, M561
III	M548E1-XM198, M577A1
IV	M548E1-XM198, M561

37. Using the speed predictions for the individual vehicles in the group and selecting the vehicle with the lowest speed as controlling the speed of the vehicle group, speed profiles were prepared for each

vehicle group for two selected conditions on primary roads, secondary roads, trails, and off-road for the HIMO West Germany and Mid-East study areas. The speed profiles for the vehicle groups are given in Tables E88-E91 (Appendix E).

38. The speed profiles for the vehicle groups were used to obtain V_{100} and percent NOGO for the primary roads, secondary roads, and trails; and V_{90} for off-road. These data and similar data for individual vehicles traveling alone are presented in Table 21 for comparison. Also shown in Table 21 is the percentage of the traverse distance that each vehicle limited the overall performance of the group. When two or more vehicles were controlling at the same time in a given terrain patch due to identical speeds in that patch, the percentage of traverse distance was included for each vehicle; therefore, the total distance of all vehicles traveling together is greater than 100 percent.

Performance Predictions for Artillery Missions

39. Performance predictions in terms of time for one-way travel between two points indicated as start and end of each mission were made for each of the study vehicles over each of the missions in the West German study area identified by the LEGAL MIX V Study Group. These performance predictions are given in Tables E92 and E93 (Appendix E). Also included in the tables are the mission distances from which, when coupled with the times, the average speeds over the routes can be computed.

PART IV: RELATIVE MOBILITY OF CANDIDATE VEHICLES

40. This study does not analyze the mobility predictions for the generalized and detailed terrain data presented in Part III but does suggest methods of establishing (a) the relative mobility of candidate prime movers for towing lightweight, medium-weight, and heavyweight artillery, (b) the relative mobility of candidate self-propelled artillery, and (c) the mobility of selected prime mover-towed artillery relative to that of self-propelled artillery. The mobility predictions for the detailed terrain data were also used to suggest methods for establishing the relative mobility for each selected group of vehicles traveling together.

Suggested Mobility Comparisons Based on Generalized Terrain Data

41. The performance parameter selected for comparing the study vehicles in each of the nine countries described by generalized terrain data was the percentage of the country with a >66-100 probability of GO (Tables 4 and 5).

Relative mobility of candidate prime movers

42. The data in Table 4 giving the percentage of country with >66-100 percent probability of GO were used to determine the relative mobility of the prime movers towing lightweight artillery (group 1), prime movers towing medium-weight artillery (group 2), and prime movers towing heavyweight artillery (group 3) in each of the nine countries (Table 22). The relative mobility of each vehicle in a group is expressed as a percent of the "best vehicle", i.e. that vehicle that can negotiate the largest percentage of a country.

Relative mobility of self-propelled artillery

43. Table 5 shows very few differences in the performances of the self-propelled artillery in terms of percent of country with >66-100 percent probability of GO, except in country B during dry conditions

where the M107 had about a 20 percent increase in GO area over the M110E2 and M109A1. The self-propelled artillery always equaled or exceeded the performance of the M60A2 and M113A1 reference vehicles.

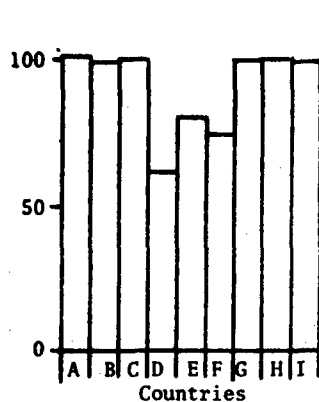
Mobility of prime mover-towed artillery
combinations relative to test of
self-propelled artillery

44. Three prime movers towing one of each weight class of artillery (lightweight, medium-weight, and heavyweight) were selected for comparing their mobility performances with the mobility performance of a selected self-propelled artillery piece. The percentages of each country (for two conditions) that the prime mover-towed artillery could negotiate with a >66-100 probability of GO are compared to similar performance data for the self-propelled M109A1 in Table 23. These data are also plotted in the form of bar graphs in Figures 3 and 4. Sufficient data are listed in Tables 4 and 5 for making similar comparisons between any of the other prime mover-towed artillery combinations and self-propelled artillery.

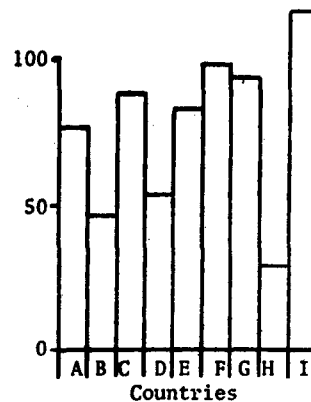
Suggested Mobility Comparisons Based on HIMO
Methodology and Detailed Terrain Data

45. The mobility of the study vehicles can be compared by using any of the single vehicle performance parameters presented in Part III. The WHEELS study⁷ used the V_{90} off-road speeds (Tables 6 and 7), the V_{100} speeds for primary and secondary roads and trails (Tables 8 and 9), and the percent of off-road terrain NOGO (Tables 12 and 13). The average link speeds (Tables 14 and 15) and the percentage of link time vehicles spent crossing linear features (Tables 16 and 17), developed for the HIMO study, also represent performance data for assessing mobility of the study vehicles. These mobility performance data are all useful in comparing study vehicles with vehicles used in other studies; however, vehicle comparisons based on the WHEELS mobility-level definitions seem to be the most useful since they define in general terms the missions that vehicles are required to complete. The WHEELS study

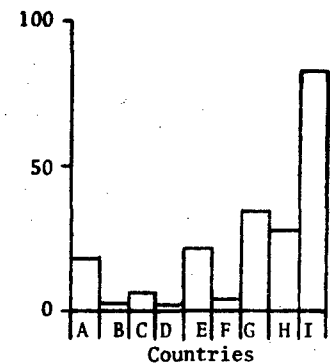
Percentage of M109A1 Performance



a. ASV-XM204

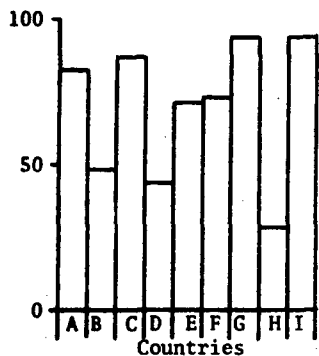


b. TDW901-XM204

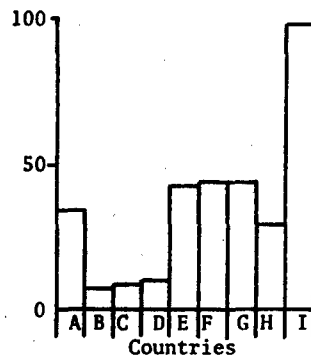


c. M561-XM204

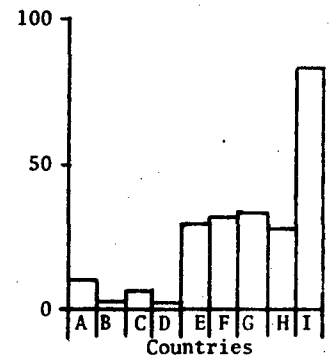
Percentage of M109A1 Performance



d. ASV-XM198

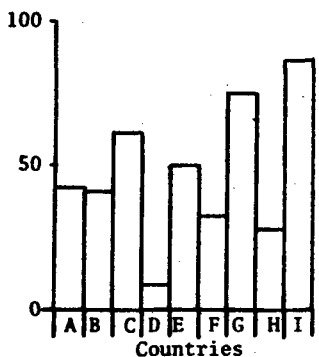


e. TDW901-XM198

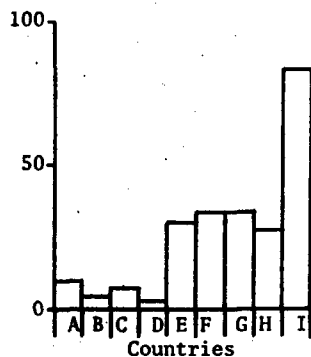


f. M656-XM198

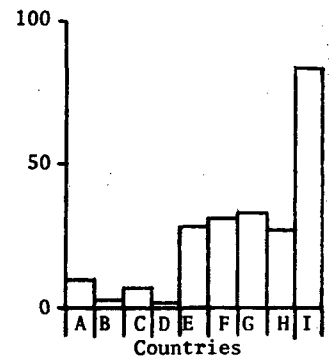
Percentage of M109A1 Performance



g. ASV-FH70



h. M125E1-FH70

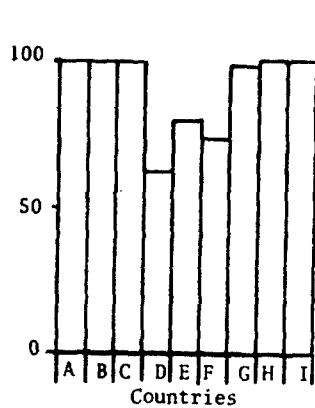


i. M520E1-FH70

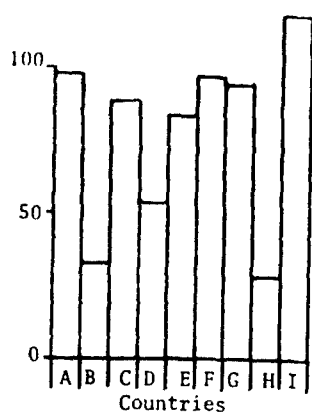
NOTE: XM204 is considered lightweight artillery, XM198 considered medium-weight artillery, and FH70 considered heavyweight artillery.

Figure 3. Comparisons of performances of the selected prime movers towing artillery of different weight classes with performance of self-propelled M109A1 in countries A-I during wet conditions

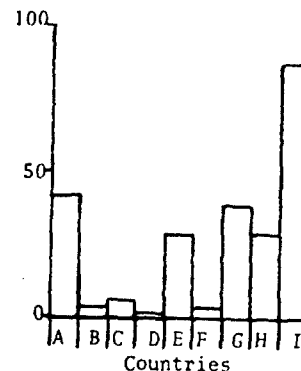
Percentage of M109A1 Performance



a. ASV-XM204

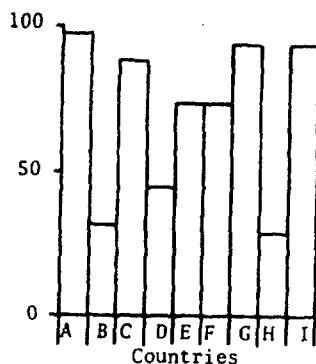


b. TDW901-XM204

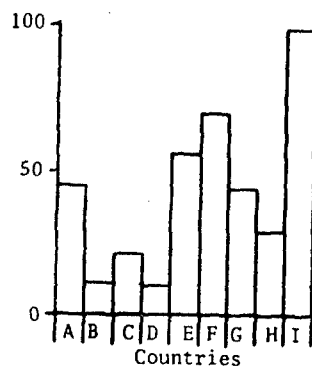


c. M561-XM204

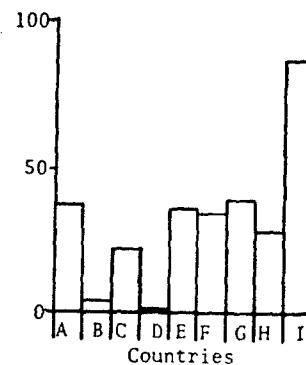
Percentage of M109A1 Performance



d. ASV-XM198

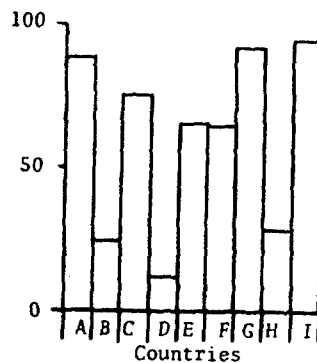


e. TDW901-XM198

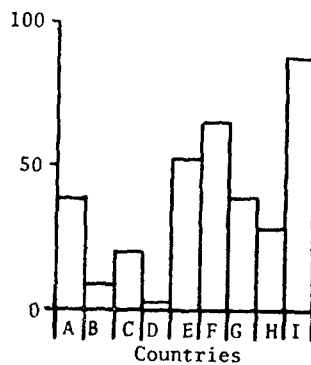


f. M656-XM198

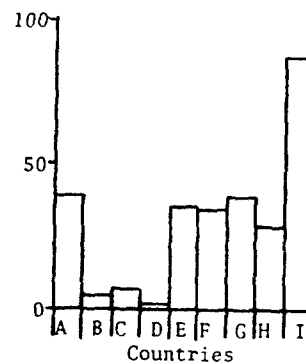
Percentage of M109A1 Performance



g. ASV-FH70



h. M125E1-FH70



i. M520E1-FH70

NOTE: XM204 is considered lightweight artillery, XM198 considered medium-weight artillery, and FH70 considered heavyweight artillery.

Figure 4. Comparisons of the performances of selected prime movers towing artillery of different weight classes with the performance of the self-propelled M109A1 in countries A-I during dry conditions

defined three levels of tactical mobility. These are given in Table 18, along with the identification of two additional mobility levels (high-high and on-road mobility), which were developed for the HIMO study to complete the range.

46. The tactical high mobility level was felt to more closely fit the missions of the towed and self-propelled artillery (see Appendix F) and is suggested as the overall parameter for comparing the mobility of the study vehicles. High-high mobility was also computed to show what effect more off-road travel would have on the study vehicles. These data are given in Tables 19 and 20. It should also be noted that the basic data are available in this report for determining other levels of mobility (on-road, support, and standard) using the equations presented in Appendix G and the definitions used for the mobility levels in Table 18.

Relative mobility of
candidate prime movers

47. Table 24 shows the relative mobility of the prime movers for towing lightweight, medium-weight, and heavyweight artillery based on the tactical high mobility level. The M35A2 ranks first in towing the lightweight artillery in the wet condition in West Germany followed closely by the ASV. The ASV ranks first in towing the lightweight artillery in the snow condition in West Germany and both wet and sand conditions of the Mid-East. The ASV and UET rank first in towing the medium-weight artillery in the wet condition in West Germany. The ASV ranks first in towing the medium-weight artillery in the snow condition of West Germany and the wet and sand conditions of the Mid-East. The ASV ranks first in towing the heavyweight artillery in the snow condition of West Germany and the sand condition of the Mid-East. None of the prime movers are acceptable for towing the heavyweight artillery in the wet conditions of the West Germany and Mid-East study areas. The prime movers towing the heavyweight artillery have better performance in the snow condition than in the wet condition because the snow condition is described as 10 in. of snow on frozen ground; whereas, the wet condition is described as a wet and slippery surface.

Relative mobility of
self-propelled artillery

48. Table 20 shows very little difference in the performances of the self-propelled artillery at the tactical high mobility level. The high-high mobility level shows a decrease in performance of all vehicles and reflects the NOGO performance of the study vehicles in off-road terrain.

Mobility of prime mover-towed artillery
relative to that of self-propelled artillery

49. The performances of four selected prime movers towing light-weight (group 1), medium-weight (group 2), and heavyweight (group 3) artillery were compared with that of the M109A1 self-propelled artillery piece for both the tactical high and high-high mobility levels (Table 25) for both wet and snow conditions in West Germany and wet and sand conditions in the Mid-East. Each group of prime movers selected for comparison contained the ASV (tracked) and the TDW901 (wheeled), which are not currently artillery prime movers, and the M548E1 (tracked) and the M561 towing group 1, M656 towing group 2, and M520E1 towing group 3 (wheeled) currently used as prime movers for towing artillery. The comparisons shown in Table 25 are also shown in Figures 5-10 in the form of bar graphs.

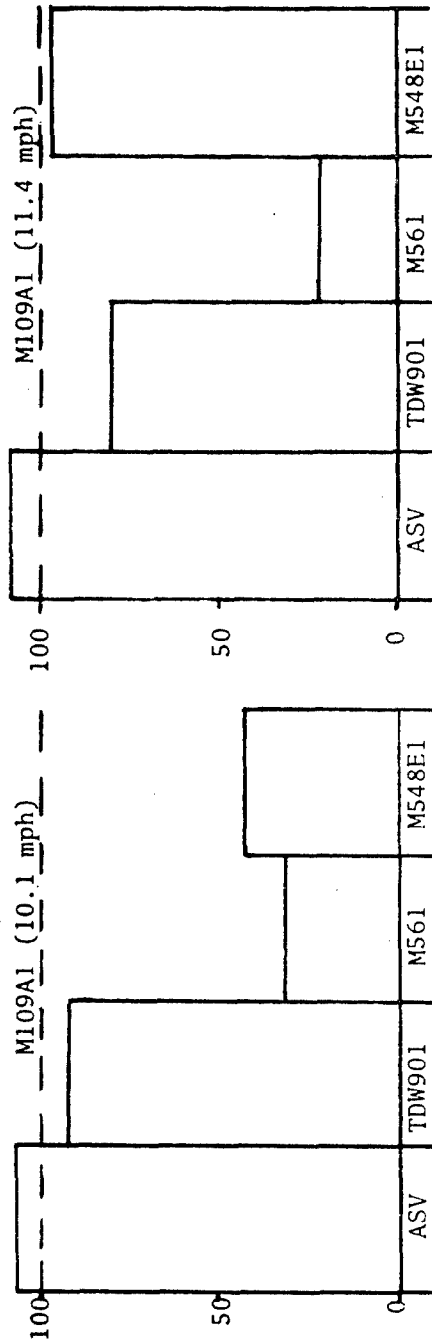
50. A minimum acceptable level of mobility has not been established for towed or self-propelled artillery. However, it is noted that in the HIMO study, the minimum acceptable level of mobility for support vehicles was described as seventy-five percent of the M60A2 mobility rating speed. This percentage or some other percentage of the M109A1 mobility rating speed might be a good method of defining the minimum acceptable level of mobility for prime movers towing artillery.

Suggested Method for Ranking of Vehicle Groups

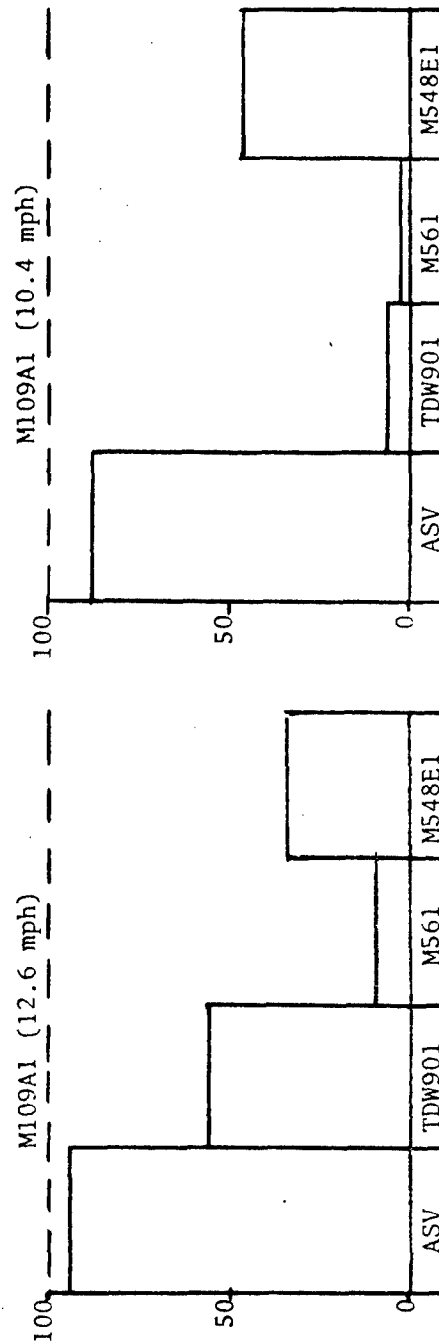
51. The data presented in Table 21 show that for primary roads, secondary roads, and trails, there is only generally a little difference between the speed of the slowest vehicle in a group and the group speed. However, off-road group performance shows that the NOGO percentages of

vehicles traveling together often add up to more than that of any individual and, therefore, have a greater effect (paragraphs 35 and 38).

52. Table 26 shows the ranking of the vehicle groups for the two selected conditions in the West Germany and the Mid-East on primary roads, secondary roads, trails, and off-road.



b. West Germany - Snow Condition



d. Mid-East - Sand Condition

Figure 5. Comparisons of the performances of selected prime movers towing lightweight artillery with the performance of self-propelled artillery at the tactical high mobility level

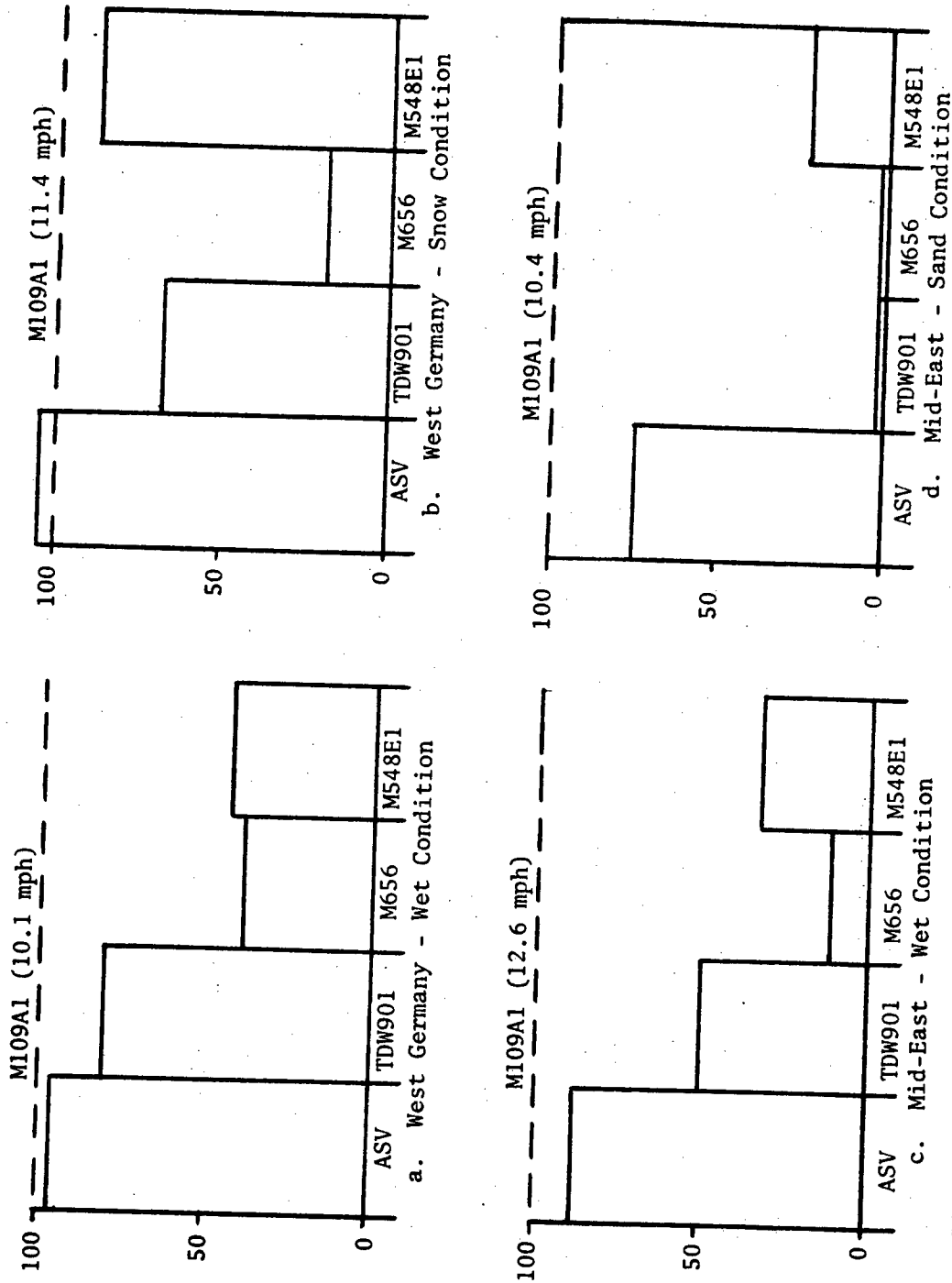
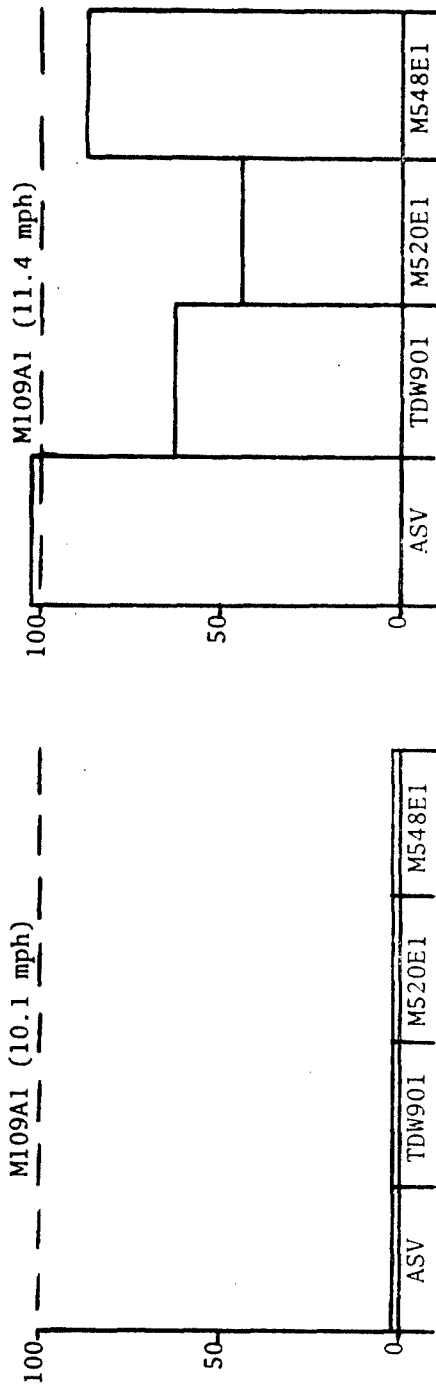
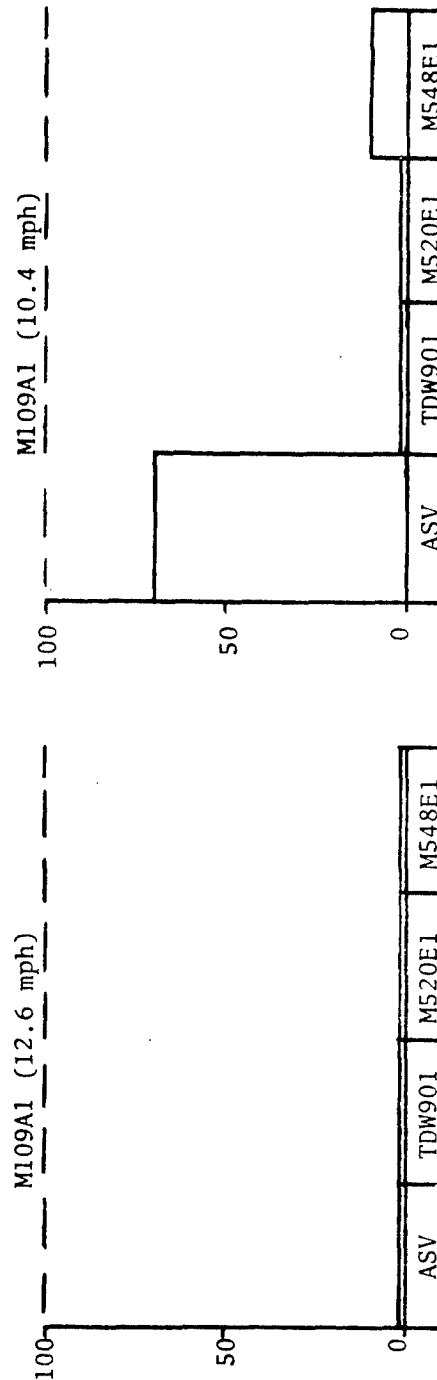


Figure 6. Comparisons of the performances of selected prime movers towing medium-weight artillery with the performance of self-propelled artillery at the tactical high mobility level



b. West Germany - Snow Condition



d. Mid-East - Sand Condition

Figure 7. Comparisons of the performances of selected prime movers towing heavyweight artillery with the performance of self-propelled artillery at the tactical high performance level

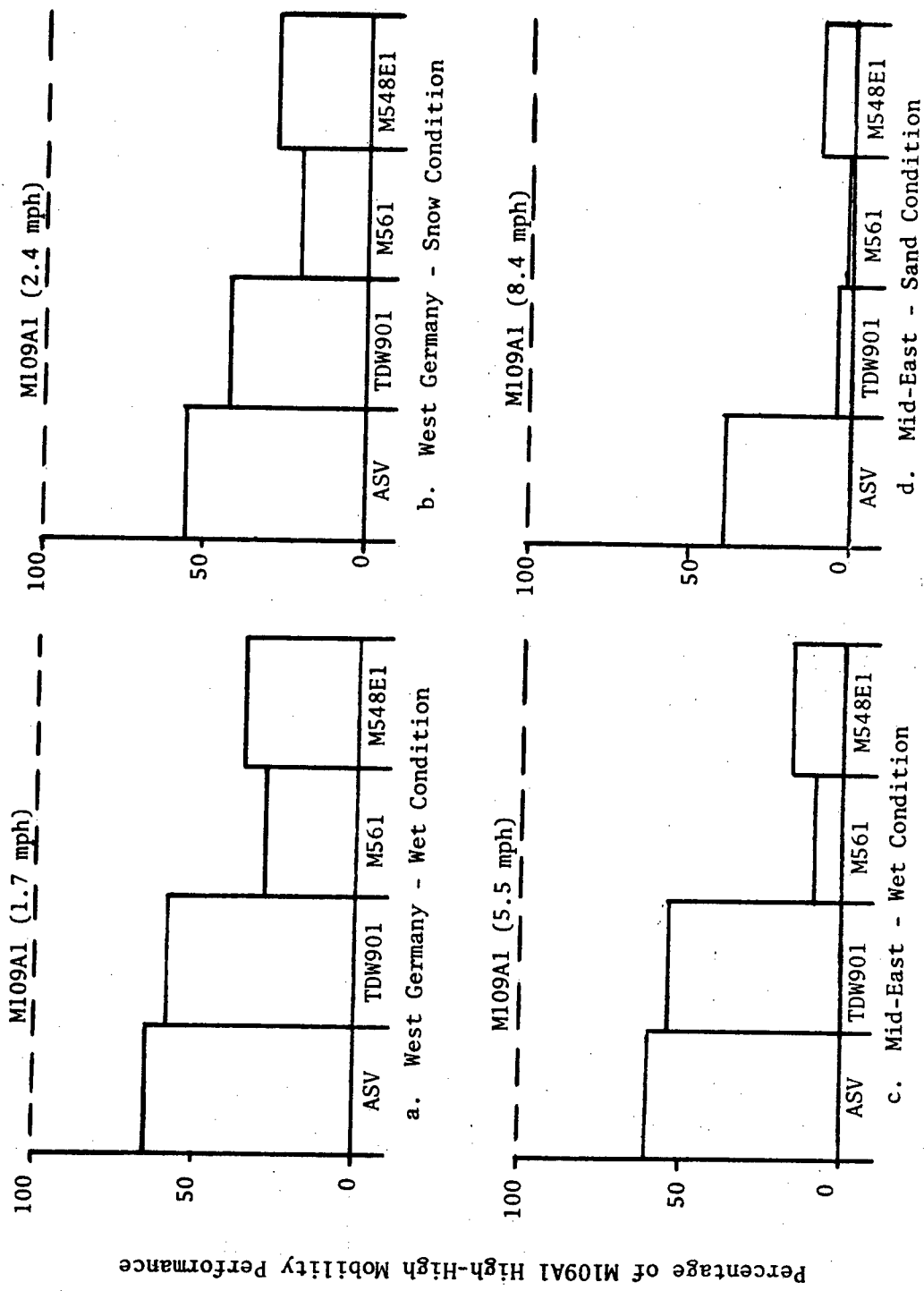


Figure 8. Comparisons of the performances of selected prime movers towing lightweight artillery with the performance of self-propelled artillery at the high-mobility level

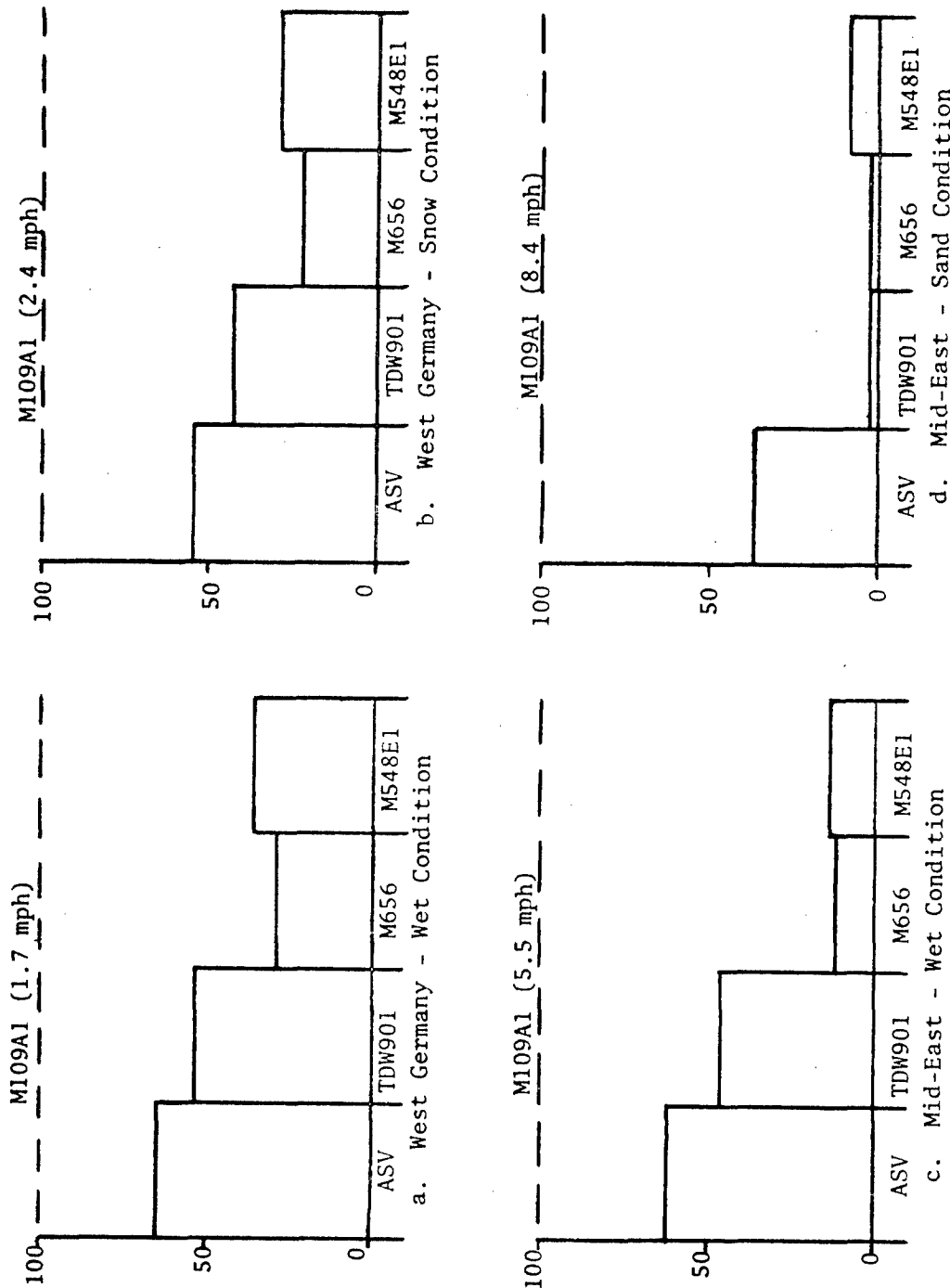


Figure 9. Comparisons of the performances of selected prime movers towing medium-weight artillery with the performance of self-propelled artillery at the high-high mobility level

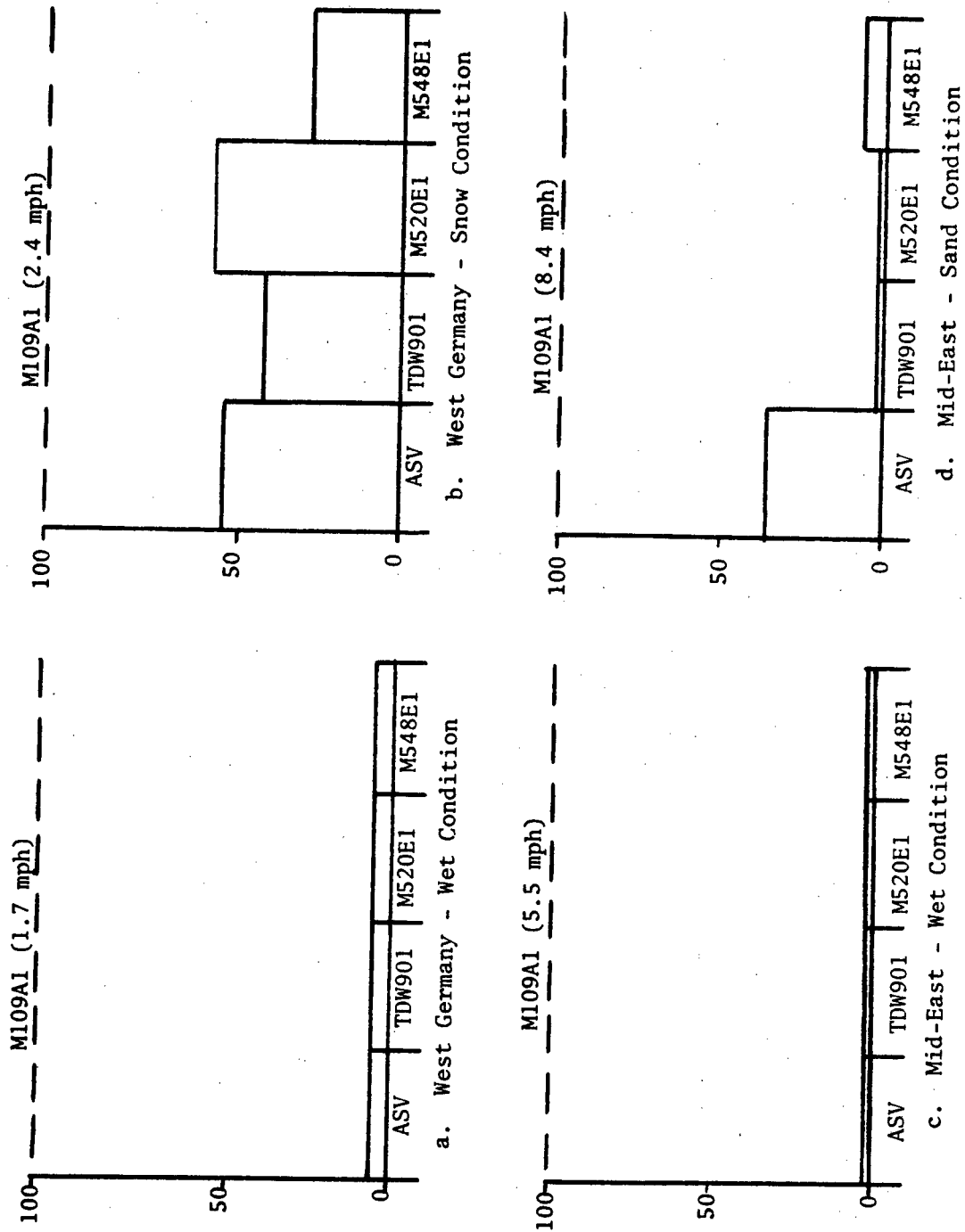


Figure 10. Comparisons of the performances of selected prime movers towing heavyweight artillery with the performance of self-propelled artillery at the high-high mobility level

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Table 1
Study Vehicles

Vehicle/Prime Mover	M102	XM204	M114A1	XM198	XM(130 mm)	PH70	Self-Propelled Artillery	Other Reference Vehicles
<u>Wheeled Prime Movers</u>								
M561, 1-1/4-ton GAMA GOAT, 6 x 6	X	X		X	X			
M35A2, 2-1/2-ton truck, cargo, 6 x 6	X	X	X	X	X	X		
M813, 5-ton truck, cargo, 6 x 6		X	X	X	X	X		
M656, 5-ton truck, cargo, 8 x 8		X	X	X	X	X		
Twister Dragon Wagon 901(TDW901), 8-ton cargo, 8 x 8		X	X	X	X	X		
M520E1, GOER, 8-ton truck, cargo, 4 x 4		X	X	X	X	X		
M125E1, 10-ton truck, cargo, 6 x 6		X	X	X	X	X		
<u>Tracked Prime Movers</u>								
M548E1, 5-ton carrier, cargo, tracked	X	X	X	X	X	X		
UET, Universal Engineer Tractor			X	X	X	X		
ASV, Artillery Support Vehicle		X	X	X	X	X		
<u>Self-Propelled (SP) Artillery</u>								
M109A1, 155 mm							X	
M107, 175 mm							X	
M10E2, 8 in.							X	
<u>Other Vehicles</u>								
M113 Armored Personnel Carrier (APC)								X
M60A2, tank, combat, full tracked								X
M548E1, 5-ton carrier, cargo, tracked								X
M577A1, carrier, Command Post (CP)								X
XM723, Mechanized Infantry Combat Vehicle (MICV)								X
XM1, tank, combat, full tracked								X
ASV, Artillery Support Vehicle								X
M561, 1-1/4-ton GAMA GOAT, 6 x 6								X
M813, 5-ton truck, cargo, 6 x 6								X
UET, Universal Engineer Tractor								X

36

Table 2
Principal Characteristics of Study Vehicles

Vehicle	Gross Vehicle Weight lb	Wheel Base in.	Power-to-Base Ratio hp/ton	Minimum Ground Clearance in.	Approach Angle deg	Departure Angle deg	Wheel Spacing in.	VCI		Max Speed mph	Speeds for Obstacle Heights at 2.5 ft in.		Six-Wheel Cross-Country Speeds for rns Elevation in in.		Six-Wheel Road and Trail Speeds for rns Elevation in in.				
								Prime Mover (Wheel)-Towed Hauler	Coarse-Grained Soil		7 in.	10 in.	1 in.	2 in.	1 in.	2 in.			
																	Fine-Grained Soil		
MS61-M102	12,500	166	16.4	11.2	62.5	52.0	85	28	34	55	55	18	8	16	12	8	24	11	3
MS61-M204	14,000	166	14.8	14.6	62.5	52.0	85	28	38	55	55	18	8	16	12	8	24	11	3
MS61-M198	24,400	166	8.4	13.2	62.5	52.0	85	38	70	55	55	18	8	16	12	8	24	11	3
MS61-M(130mm)	25,800	166	8.0	14.0	62.5	52.0	85	43	80	55	55	18	8	16	12	8	24	11	3
MS5A2-M102	22,600	154	12.3	11.2	40.0	40.0	130	32	34	58	58	38	13	17	10	8	24	10	5
MS5A2-M204	24,100	154	11.6	12.9	40.0	40.0	130	33	36	58	58	38	13	17	10	8	24	10	5
MS5A2-M14A1	32,000	154	8.8	10.0	40.0	40.0	130	37	48	58	58	38	13	17	10	8	24	10	5
MS5A2-M198	34,600	154	8.0	12.9	40.0	40.0	130	38	60	58	58	38	13	17	10	8	24	10	5
MS5A2-M170	38,500	154	7.3	12.9	40.0	40.0	130	46	84	58	58	38	13	17	10	8	24	10	5
MS5A2-M(130 mm)	35,900	154	7.8	12.9	40.0	40.0	130	41	61	58	58	38	13	17	10	8	24	10	5
MS13-M204	37,300	179	18.7	11.5	35.0	39.0	152	36	38	52	52	40	7	14	8	5	29	12	4
MS13-M14A1	45,200	179	11.7	10.0	35.0	39.0	152	38	44	52	52	40	7	14	8	5	29	12	4
MS13-M198	47,800	179	11.1	11.5	35.0	39.0	152	39	55	52	52	40	7	14	8	5	29	12	4
MS13-M170	51,800	179	10.2	11.5	35.0	39.0	152	44	76	52	52	40	7	14	8	5	29	12	4
MS13-M(130 mm)	49,100	179	10.8	11.5	35.0	39.0	152	41	59	52	52	40	7	14	8	5	29	12	4
MS56-M204	30,600	148	13.8	12.0	50.0	61.5	90	26	22	50	50	22	10	17	10	10	26	12	9
MS56-M14A1	38,500	148	11.0	10.0	50.0	61.5	90	31	31	50	50	22	10	17	10	10	26	12	9
MS56-M198	41,100	148	10.3	12.0	50.0	61.5	90	33	42	50	50	22	10	17	10	10	26	12	9
MS56-M170	45,100	148	9.4	12.0	50.0	61.5	90	85	61	50	50	22	10	17	10	10	26	12	9
MS56-M(130 mm)	42,400	148	9.9	12.0	50.0	61.5	90	37	44	50	50	22	10	17	10	10	26	12	9
TM901-M204	43,800	160	10.3	15.0	55.0	65.0	102	27	26	56	56	48	18	21	12	12	28	16	15
TM901-M14A1	51,700	160	8.7	10.0	55.0	65.0	102	31	34	56	56	48	18	21	12	12	28	16	15
TM901-M198	54,200	160	8.3	13.2	55.0	65.0	102	32	42	56	56	48	18	21	12	12	28	16	15
TM901-M170	58,200	160	7.7	15.0	55.0	65.0	102	84	57	56	56	48	18	21	12	12	28	16	15
TM901-M(130 mm)	55,600	160	8.1	14.0	55.0	65.0	102	36	44	56	56	48	18	21	12	12	28	16	15
MS20E1-M204	48,000	235	8.9	15.0	35.0	35.0	235	38	23	30	30	30	4	9	6	6	15	8	6
MS20E1-M14A1	55,900	235	7.6	10.0	35.0	35.0	235	40	30	30	30	30	4	9	6	6	15	8	6
MS20E1-M198	58,500	235	7.3	13.2	35.0	35.0	235	39	38	30	30	30	4	9	6	6	15	8	6
MS20E1-M170	62,500	235	6.8	15.7	35.0	35.0	235	68	53	30	30	30	4	9	6	6	15	8	6
MS20E1-M(130 mm)	59,800	235	7.1	14.0	35.0	35.0	235	39	41	30	30	30	4	9	6	6	15	8	6
MI25E1-M14A1	64,300	182	9.3	10.0	30.0	45.0	140	44	35	41	41	40	7	17	9	7	34	12	7
MI25E1-M198	66,900	182	9.0	13.2	30.0	45.0	140	44	42	41	41	40	7	17	9	7	34	12	7
MI25E1-M170	70,900	182	8.5	15.7	30.0	45.0	140	83	56	41	41	40	7	17	9	7	34	12	7
Prime Mover (Tracked)-Towed Hauler																			
MS48E1-M102	29,800	NA	13.6	11.2	57.0	35.0	NA	25	0	39	39	39	7	15	10	9	22	11	9
MS48E1-M204	31,200	NA	12.9	15.0	57.0	35.0	NA	25	0	39	39	39	7	15	10	9	22	11	9
MS48E1-M14A1	39,200	NA	10.3	10.0	57.0	35.0	NA	30	0	39	39	39	7	15	10	9	22	11	9
MS48E1-M198	41,700	NA	9.7	13.2	57.0	35.0	NA	31	0	39	39	39	7	15	10	9	22	11	9
MS48E1-M170	45,700	NA	8.8	15.7	57.0	35.0	NA	84	0	39	39	39	7	15	10	9	22	11	9
MS48E1-M(130 mm)	43,000	NA	9.4	14.0	57.0	35.0	NA	31	0	39	39	39	7	15	10	9	22	11	9
UET-M14A1	50,360	NA	11.3	10.0	34.0	34.0	NA	29	0	30	30	30	20	30	15	11	45	17	11
UET-M198	52,960	NA	10.8	13.2	34.0	34.0	NA	31	6	30	30	30	20	30	15	11	45	17	11
UET-M170	56,900	NA	10.0	15.7	34.0	34.0	NA	83	0	30	30	30	20	30	15	11	45	17	11
ASV-M204	55,500	NA	16.2	14.0	67.0	45.0	NA	25	0	42	42	42	14	32	22	16	44	26	16
ASV-M14A1	63,400	NA	14.2	10.0	67.0	45.0	NA	29	0	42	42	42	14	32	22	16	44	26	16
ASV-M198	66,000	NA	13.6	13.2	67.0	45.0	NA	30	0	42	42	42	14	32	22	16	44	26	16
ASV-M170	70,000	NA	12.9	14.0	67.0	45.0	NA	33	0	42	42	42	14	32	22	16	44	26	16
ASV-M(130 mm)	67,300	NA	13.4	14.0	67.0	45.0	NA	35	0	42	42	42	14	32	22	16	44	26	16

Continued

(Continued)

Table 2 (Concluded)

Vehicle	Gross Vehicle Weight lb	Wheel Base in.	Power-to-Rate Ratio hp/ton	Minimum Ground Clearance in.	Approach Angle deg.	Departure Angle deg.	Wheel Spacing in.	VCI		Max Speed mph	Speeds for Obstacle Heights at 2.5 g's			Six-Watt Cross-Country Speeds for rms Elevation			Six-Watt Road and Trail Speeds for rms Elevation		
								Fine-Grained Soil	Coarse-Grained Soil		2 in.	6 in.	10 in.	1 in.	2 in.	3 in.	1 in.	2 in.	3 in.
Self-Propelled Artillery																			
M109A1	53,100	NA	15.7	17.7	75.0	80.5	NA	25	0	35	35	17	12	30	16	14	36	16	14
M107	62,100	NA	13.0	14.8	90.0	43.5	NA	22	0	34	34	17	12	30	16	14	36	16	14
M110E2	62,100	NA	13.7	18.4	90.0	44.5	NA	22	0	34	34	17	12	30	16	14	36	16	14
Other Vehicles																			
M113A1	23,400	NA	17.9	16.0	70.0	40.0	NA	16	0	40	40	40	10	24	13	12	34	15	10
M60A2	104,000	NA	15.0	18.0	90.0	42.5	NA	21	0	30	30	30	12	44	20	13	44	20	13
M548E1	26,500	NA	15.3	16.0	57.0	35.0	NA	16	0	40	40	40	7	15	10	9	22	11	9
M577A1	24,400	NA	17.9	16.0	70.0	40.0	NA	16	0	40	40	40	10	24	13	12	34	15	10
M4723	40,400	NA	22.3	18.0	83.0	78.0	NA	12	0	48	48	48	14	32	22	22	44	26	16
M41	115,400	NA	26.0	19.0	77.0	68.0	NA	26	0	48	48	48	14	32	22	22	44	26	16
ASV	50,700	NA	17.7	14.0	67.0	45.0	NA	15	0	42	42	42	14	32	22	22	44	26	16
M561	9,170	166	22.5	14.6	62.5	52.0	85	19	13	55	55	18	8	16	12	8	24	11	3
M815	32,540	179	16.3	11.5	35.0	39.0	152	35	26	52	52	40	7	14	8	5	29	12	4
UET	37,700	NA	15.1	18.0	34.0	34.0	NA	18	0	30	30	30	20	30	15	11	45	17	11

Table 3
Characteristics of As-Is* Route Networks

Network Type	Primary Roads, %	Secondary Roads, %	Trails %	Off-Road %
HIMO routes, West Germany**	20.3	64.5	15.2	0.0
Artillery routes, West Germany†	14.8	33.1	42.0	10.1
HIMO routes, Mid-East††	1.1	16.1	51.3	31.5

* See paragraph 33 for definitions of "as-is."

** Based on a total distance of 309.7 miles of network routes.

† Based on a total distance of 84.7 miles of network routes.

†† Based on a total distance of 84.8 miles of network routes.

Table 4
Performance Predictions for Prime Mover-Towed Artillery Combinations in the Countries Described by Generalized Terrain Data

Vehicle	Percentage of Country with Indicated Probability of GO														
	Lightweight Artillery						Medium-Weight Artillery						Heavyweight Artillery		
	3340-lb M102			4775-lb XM204			12700-lb M114A1			15250-lb XM198			16590-lb XM(130-mm)		
	0-33	>33-66	>66-100	0-33	>33-66	>66-100	0-33	>33-66	>66-100	0-33	>33-66	>66-100	0-33	>33-66	>66-100
Country A - Wet Condition															
M561	45.0	22.8	32.2	63.5	19.5	17.0			100.0	0.0	0.0	100.0	0.0	0.0	
M35A2	28.4	31.0	40.6	38.0	31.5	30.5	83.0	14.2	2.8	96.5	3.5	0.0	98.3	1.7	0.0
M813				28.4	30.5	41.1	58.9	15.0	26.0	69.1	21.0	9.8	69.5	20.6	9.8
M656				8.0	30.0	62.0	59.3	14.7	26.0	74.0	16.2	9.8	74.1	23.2	2.8
TDW901				7.7	20.7	71.6	18.9	44.0	37.1	32.5	35.5	32.0	42.1	26.0	32.0
M520E1				32.8	23.1	44.1	48.6	27.7	23.7	64.9	16.3	18.8	64.9	16.4	18.8
M125E1							32.5	36.7	30.7	33.1	41.2	25.6			
M548E1	3.1	3.2	93.7	3.3	3.6	93.1	6.3	35.8	57.9	10.9	52.3	36.8	10.9	56.6	32.5
UET							5.1	15.9	79.0	5.2	23.3	71.5			
ASV				1.5	3.3	95.2	3.9	10.0	86.1	5.1	16.0	78.9	5.1	18.6	76.3
Country A - Dry Condition															
M561	40.6	13.8	45.6	44.8	15.1	40.2			100.0	0.0	0.0	100.0	0.0	0.0	
M35A2	4.5	36.8	58.7	7.8	37.2	55.0	59.8	24.3	15.9	82.1	17.9	0.0	93.1	6.9	0.0
M813				4.5	36.7	58.8	41.2	14.4	44.4	44.6	17.9	37.6	45.1	17.4	37.6
M656				3.7	4.1	92.2	41.3	14.3	44.4	55.6	6.9	37.5	55.6	28.6	15.9
TDW901				3.4	1.0	95.5	3.7	40.6	55.7	4.5	50.8	44.7	7.8	47.5	44.7
M520E1				4.2	6.5	89.3	8.1	39.3	52.6	41.5	16.7	41.8	41.5	16.7	41.8
M125E1							4.5	40.1	55.4	4.5	41.2	54.3			
M548E1	2.3	1.4	96.3	2.3	1.4	96.3	3.7	14.3	82.0	3.7	41.0	55.2	3.7	50.7	45.6
UET							3.5	1.0	95.5	3.7	0.8	95.5			
ASV				0.0	2.3	97.7	2.3	1.5	96.3	2.5	2.0	95.5	3.5	1.0	95.2
Country B - Wet Condition															
M561	96.1	2.1	1.8	96.1	3.4	0.5			100.0	0.0	0.0	100.0	0.0	0.0	
M35A2	87.3	8.8	3.9	87.4	10.2	2.4	98.8	1.2	0.0	100.0	0.0	0.0	100.0	0.0	0.0
M813				87.3	8.8	3.9	96.1	2.1	1.8	96.1	3.4	0.5	96.1	3.4	0.5
M656				86.1	1.3	12.6	96.1	2.1	1.8	96.1	3.4	0.5	96.1	3.9	0.0
TDW901				84.3	1.3	14.5	85.5	10.5	3.9	85.5	12.1	2.4	87.4	10.2	2.4
M520E1				85.5	3.5	11.1	87.4	10.2	2.4	96.1	2.1	1.8	96.1	2.1	1.8
M125E1							87.3	10.3	2.4	87.3	10.3	2.4			
M548E1	65.7	14.1	20.2	65.7	14.2	20.1	79.8	7.3	12.9	83.6	12.8	3.6	84.4	12.0	3.6
UET							77.2	9.2	13.6	77.3	10.4	12.3			
ASV				20.6	48.2	31.2	65.9	14.9	19.6	68.6	16.3	15.1	77.0	7.9	15.1
Country B - Dry Condition															
M561	91.0	5.0	4.0	91.0	6.1	2.9			100.0	0.0	0.0	100.0	0.0	0.0	
M35A2	75.6	15.4	9.0	79.5	12.1	8.4	92.7	7.3	0.0	100.0	0.0	0.0	100.0	0.0	0.0
M813				75.6	15.4	9.0	91.0	5.0	4.0	91.0	6.1	2.9	91.0	6.1	2.9
M656				74.9	4.7	20.5	91.0	5.0	4.0	91.0	6.1	2.9	91.0	5.0	0.0
TDW901				74.9	1.1	24.8	76.0	15.0	9.0	76.0	15.6	8.4	79.5	12.1	8.4
M520E1				75.6	4.5	19.9	79.5	12.1	8.4	91.0	5.0	4.0	91.0	5.0	4.0
M125E1							75.6	16.0	8.4	76.0	15.6	8.4			
M548E1	21.5	53.3	25.1	21.5	53.6	24.8	74.9	4.4	20.7	75.2	20.8	4.0	75.2	20.8	4.0
UET							74.9	1.0	24.2	75.2	5.7	19.1			
ASV				0.1	22.3	77.6	21.9	53.3	24.8	22.3	52.9	24.8	74.8	0.4	24.8
Country C - Wet Condition															
M561	44.7	47.9	7.4	50.0	44.3	5.7			100.0	0.0	0.0	100.0	0.0	0.0	
M35A2	12.4	37.6	50.0	14.2	15.3	32.5	92.7	7.3	0.0	95.3	4.7	0.0			
M813				12.4	37.6	50.0	50.0	42.7	7.3	50.1	44.5	5.4	51.9	42.7	5.4
M656				12.4	1.8	85.8	44.7	48.0	7.3	73.6	21.0	5.4	73.6	26.4	0.0
TDW901				7.8	4.7	87.5	12.5	37.5	50.0	12.5	78.5	9.0	19.5	71.5	9.0
M520E1				13.2	24.1	62.7	19.6	50.0	30.4	50.0	42.9	7.1	50.0	42.9	7.0
M125E1							17.7	49.8	32.5	17.8	51.8	30.4			
M548E1	0.0	7.8	92.2	0.0	12.5	87.5	12.4	22.9	24.7	12.5	56.6	30.9	12.5	58.4	29.1
UET							7.8	27.5	64.7	12.5	24.4	63.1			
ASV				0.0	0.1	99.9	0.0	12.5	87.5	0.1	12.4	87.5	7.8	4.7	87.5
Country C - Dry Condition															
M561	44.7	47.9	7.4	45.7	48.4	5.9			100.0	0.0	0.0	100.0	0.0	0.0	
M35A2	12.4	33.3	54.3	13.8	40.9	45.4	79.6	18.9	1.5	95.1	4.9	0.0			
M813				12.4	33.3	54.3	45.7	46.9	7.4	45.7	48.5	5.8	46.9	47.3	5.8
M656				12.4	1.4	86.2	44.7	47.9	7.4	69.2	24.9	21.8	69.2	29.3	1.5
TDW901				7.8	4.7	87.5	12.5	33.2	54.3	12.5	65.7	21.8	14.8	63.4	21.8
M520E1				8.9	15.0	76.1	14.8	41.1	44.1	45.7	47.0	7.3	45.7	47.0	7.3
M125E1							13.4	41.2	45.4	13.5	42.4	44.1			
M548E1	0.0	7.8	92.2	0.0	12.5	87.5	12.4	10.1	77.5	12.5	56.6	30.9	12.5	57.7	29.8
UET							7.8	14.7	77.5	12.5	24.4	63.1			
ASV				0.0	0.0	100.0	0.0	12.5	87.5	0.0	12.5	87.5	7.8	4.7	87.5

(Continued)

(Sheet 1 of 3)

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Table 4 (Continued)

Percentage of Country with Indicated Probability of GO															
Vehicle	Lightweight Artillery						Medium-Weight Artillery						Heavyweight Artillery		
	3340-lb			4775-lb			12700-lb			15250-lb			16590-lb		
	M102	M102	M102	M204	M204	M204	M114A1	M114A1	M114A1	M198	M198	M198	M(130-mm)	M(130-mm)	M(130-mm)
	0-33	>33-66	>66-100	0-33	>33-66	>66-100	0-33	>33-66	>66-100	0-33	>33-66	>66-100	0-33	>33-66	>66-100
Country D - Wet Condition															
MS61	77.0	21.9	1.2	90.2	9.0	0.9				100.0	0.0	0.0	100.0	0.0	0.0
M35A2	65.6	18.6	15.8	66.7	26.8	6.5	98.2	1.8	0.0	99.5	0.5	0.0	99.5	0.5	0.0
M813				59.0	25.0	16.0	83.5	8.9	7.6	83.6	15.4	1.0	88.4	10.6	1.0
M656				36.9	29.7	33.4	70.7	22.2	7.1	88.5	10.5	1.0	88.9	11.1	0.0
TDW901				27.0	31.7	41.3	36.2	47.4	16.5	36.7	55.1	8.2	72.4	19.4	8.2
MS20E1				49.2	27.2	23.5	72.8	19.4	7.9	83.6	9.1	7.3	83.6	9.1	7.3
M125E1							49.4	37.6	13.0	49.8	37.7	12.5			
MS48E1	56.7	8.7	34.6	56.7	15.1	28.2	71.1	16.9	12.0	71.8	22.1	6.0	71.8	26.9	1.2
UET							29.9	51.6	18.5	36.2	45.9	17.9			
ASV				21.5	30.8	47.7	21.6	43.5	34.8	45.5	19.8	34.7	49.3	16.0	34.7
Country D - Dry Condition															
MS61	77.0	21.9	1.2	90.2	9.0	0.9				100.0	0.0	0.0	100.0	0.0	0.0
M35A2	65.6	18.6	15.8	66.7	26.8	6.5	98.2	1.8	0.0	99.5	0.5	0.0	99.5	0.5	0.0
M813				58.1	25.9	16.0	83.5	8.9	7.6	83.6	15.4	1.0	86.1	12.9	1.0
M656				36.9	29.7	33.4	70.7	22.2	7.1	88.5	10.5	1.0	88.9	11.1	0.0
TDW901				26.9	30.9	42.2	36.2	47.4	16.5	36.7	55.1	8.2	71.5	20.3	8.2
MS20E1				46.3	29.2	24.5	71.9	17.9	10.2	83.6	9.1	7.3	83.6	9.1	7.3
M125E1							49.4	37.6	13.0	49.8	37.7	12.5			
MS48E1	56.7	8.7	34.7	56.7	15.1	28.2	71.1	16.9	12.0	71.8	22.1	6.0	71.8	24.6	3.6
UET							29.8	51.7	18.5	36.2	45.9	17.9			
ASV				21.5	29.6	48.9	21.6	43.5	34.8	43.4	21.9	34.7	48.4	17.0	34.7
Country E - Wet Condition															
MS61	56.7	19.0	24.2	70.7	12.0	17.3				100.0	0.0	0.0	100.0	0.0	0.0
M35A2	41.3	19.3	39.3	43.4	31.9	24.7	75.3	21.7	3.0	94.5	5.3	0.2	96.0	3.8	0.2
M813				32.5	28.2	39.3	58.1	8.0	33.9	58.1	18.2	23.7	58.5	17.8	23.7
M656				25.0	15.8	59.2	49.5	14.1	36.4	58.7	17.7	23.6	58.7	38.3	3.0
TDW901				24.6	7.8	67.6	25.0	33.3	41.6	30.2	35.6	34.2	43.0	22.9	34.2
MS20E1				41.4	9.5	49.1	45.6	20.6	33.7	60.8	6.0	33.2	60.8	6.0	33.2
M125E1							38.8	26.6	34.6	38.8	27.0	34.2			
MS48E1	26.1	20.2	53.7	34.0	12.3	53.7	39.2	33.9	26.9	46.3	29.3	24.4	46.3	29.6	24.1
UET							27.8	26.9	45.3	27.8	27.1	45.1			
ASV				14.3	21.2	64.5	22.6	13.7	63.6	29.1	12.4	58.4	29.6	12.1	58.3
Country E - Dry Condition															
MS61	52.7	23.0	24.3	57.8	18.4	23.9				99.9	0.1	0.0	99.9	0.1	0.0
M35A2	37.1	10.9	52.0	37.6	23.1	39.3	54.4	40.2	5.4	94.1	5.7	0.2	94.1	5.7	0.2
M813				28.2	19.7	52.0	45.4	20.5	34.1	45.4	23.9	30.7	45.5	23.8	30.7
M656				20.9	14.1	65.0	45.4	18.1	36.6	46.0	23.3	30.7	46.0	48.6	5.4
TDW901				20.6	7.7	71.8	21.0	24.4	54.6	26.0	25.4	48.6	28.6	22.7	48.6
MS20E1				28.6	5.9	65.6	31.2	20.0	48.8	48.0	18.2	33.8	48.0	18.2	33.8
M125E1							26.0	24.9	49.1	26.1	24.8	49.0			
MS48E1	25.5	16.6	57.9	33.9	8.4	57.8	34.9	23.8	41.2	42.2	33.2	24.5	42.2	33.2	24.5
UET							23.6	16.7	59.7	23.7	31.1	45.2			
ASV				14.2	17.2	68.6	22.6	9.7	67.7	25.0	12.4	62.6	25.5	12.0	62.5
Country F - Wet Condition															
MS61	72.4	24.5	3.0	81.2	16.5	2.2				100.0	0.0	0.0	100.0	0.0	0.0
M35A2	42.2	12.4	45.4	44.8	51.1	4.1	74.2	25.8	0.0	99.8	0.1	0.0	99.8	0.1	0.0
M813				23.1	31.0	46.0	51.6	18.9	29.5	54.1	21.4	24.5	54.3	21.2	24.5
M656				21.0	21.1	57.9	42.7	27.7	29.6	54.3	21.3	24.4	54.3	45.0	0.0
TDW901				20.8	2.4	76.7	21.7	29.9	48.4	21.9	44.4	33.7	32.3	34.1	33.7
MS20E1				30.6	19.0	50.4	35.0	34.0	31.0	54.2	16.4	29.4	54.2	16.4	29.4
M125E1							30.6	38.2	31.3	30.9	37.9	31.2			
MS48E1	47.7	23.4	28.9	48.0	23.4	28.6	48.8	46.8	4.5	71.7	25.2	3.0	71.7	25.3	3.0
UET							21.3	44.2	34.4	22.1	45.1	32.8			
ASV				20.1	21.4	58.5	21.2	21.1	57.7	22.6	19.8	57.6	22.8	21.9	55.3
Country F - Dry Condition															
MS61	72.4	24.5	3.0	72.4	24.7	2.9				99.9	0.1	0.0	99.9	0.1	0.0
M35A2	41.6	2.0	56.4	42.4	31.1	26.5	49.5	50.3	0.2	99.7	0.2	0.1	99.7	0.2	0.1
M813				22.2	20.6	57.2	42.6	25.2	32.2	42.7	30.0	27.3	42.8	29.9	27.3
M656				20.3	21.8	57.9	42.6	25.2	32.1	42.9	30.0	27.1	42.9	56.9	0.2
TDW901				20.7	2.2	77.1	21.4	21.2	57.3	21.6	22.4	55.9	22.9	21.2	55.9
MS20E1				20.8	3.4	75.9	22.9	21.1	56.0	42.6	25.2	32.2	42.6	25.2	32.2
M125E1							21.0	23.0	56.1	21.7	22.3	56.0			
MS48E1	45.8	24.8	29.5	46.1	25.2	28.7	46.3	27.2	26.5	71.7	25.2	3.1	71.7	25.2	3.0
UET							20.9	22.6	56.6	21.8	45.4	32.8			
ASV				19.9	21.4	58.6	20.9	21.4	57.7	22.2	20.1	57.7	22.4	20.0	57.6

(Continued)

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Table 4 (Concluded)

Percentage of Country with Indicated Probability of GO																		
Vehicle	Lightweight Artillery						Medium-Weight Artillery						Heavyweight Artillery					
	3340-1b			4775-1b			12700-1b			15250-1b			16590-1b			19250-1b		
	0-33	33-66	>66-100	0-33	33-66	>66-100	0-33	33-66	>66-100	0-33	33-66	>66-100	0-33	33-66	>66-100	0-33	33-66	>66-100
Country G - Wet Condition																		
M561	35.8	14.9	49.2	38.3	28.7	33.0				100.0	0.0	0.0	100.0	0.0	0.0			
M35A2	6.2	30.1	63.7	10.0	28.3	61.7	67.0	21.4	11.6	86.8	13.2	0.0	86.9	13.1	0.0	88.4	11.6	0.0
M813				6.2	30.1	63.7	36.3	21.1	42.6	38.3	28.7	33.0	38.4	28.6	33.0	67.0	21.4	11.6
M656				5.7	4.3	90.0	36.3	21.1	42.6	57.4	9.6	33.0	57.4	31.0	11.6	67.0	33.0	0.0
TDW901				2.7	3.5	93.8	5.8	32.5	61.7	6.2	51.2	42.6	10.0	47.3	42.6	50.8	17.9	31.4
MS20E1				6.2	3.9	90.0	10.0	40.7	49.2	36.3	21.1	42.6	36.3	21.1	42.6	50.8	16.2	33.0
M125E1							6.2	30.1	63.7	6.2	32.1	61.7				24.6	42.4	33.0
MS48E1	0.0	2.7	97.3	0.0	5.7	94.3	5.7	0.4	93.8	5.7	12.6	61.7	5.7	45.0	49.2	24.1	33.2	42.6
UET							2.7	3.5	93.8	5.7	0.4	93.8				5.7	45.0	49.2
ASV				0.0	0.7	99.3	0.0	5.8	94.2	0.8	5.4	93.8	2.7	3.5	93.8	5.7	18.8	75.4
Country G - Dry Condition																		
M561	35.8	2.7	61.4	36.3	24.5	39.2				100.0	0.0	0.0	100.0	0.0	0.0			
M35A2	6.2	30.1	63.7	8.9	27.4	63.7	60.8	26.1	13.1	86.8	13.2	0.0	86.9	13.1	0.0	86.9	13.1	0.0
M813				6.2	30.1	63.7	36.3	21.1	42.6	36.3	24.5	39.2	36.3	24.5	39.2	60.8	26.1	13.1
M656				5.7	3.2	91.1	36.3	21.1	42.6	57.4	3.4	39.2	57.4	29.5	13.1	60.8	39.2	0.0
TDW901				2.7	3.5	93.8	5.8	30.6	63.7	6.2	51.2	42.6	8.9	48.4	42.6	36.5	24.4	39.1
MS20E1				3.2	5.8	91.1	8.9	27.5	63.5	36.3	21.1	42.6	36.3	21.1	42.6	36.5	24.3	39.2
M125E1							6.2	30.1	63.7	6.2	30.1	63.7				9.2	51.6	39.2
MS48E1	0.0	2.7	97.3	0.0	5.7	94.3	5.7	0.4	93.8	5.7	30.6	63.7	5.7	32.7	61.5	8.8	48.6	42.6
UET							2.7	3.7	93.8	5.7	0.4	93.8				5.7	30.8	63.5
ASV				0.0	0.6	99.4	0.0	5.8	94.2	0.6	5.6	93.8	2.7	3.5	93.8	2.7	6.4	90.8
Country H - Wet Condition																		
M561	70.8	0.0	29.2	70.8	0.5	28.7				100.0	0.0	0.0	100.0	0.0	0.0			
M35A2	70.8	0.0	29.2	70.8	0.5	28.7	71.3	28.5	0.2	99.8	0.2	0.0	99.8	0.2	0.0	99.8	0.2	0.0
M813				70.8	0.0	29.2	70.8	0.5	28.7	71.3	1.1	27.6	71.3	1.1	27.6	72.4	27.4	0.2
M656				70.8	0.0	29.2	70.8	0.5	28.7	71.3	1.1	27.6	71.3	28.5	0.2	72.4	27.6	0.0
TDW901				70.8	0.0	29.2	70.8	0.0	29.2	70.8	0.0	29.2	70.8	0.0	29.2	72.4	0.0	27.6
MS20E1				70.8	1.6	27.6	71.3	1.1	27.6	71.3	1.1	27.6	71.3	1.1	27.6	72.4	0.0	27.6
M125E1							70.8	0.5	28.7	70.8	0.5	28.7				72.4	0.0	27.6
MS48E1	0.0	70.8	29.2	0.0	70.8	29.2	70.8	0.0	29.2	70.8	0.0	29.2	70.8	0.0	29.2	72.4	0.0	27.6
UET							70.8	0.0	29.2	70.8	0.0	29.2				72.4	0.0	27.6
ASV				0.0	0.0	100.0	0.0	70.8	29.2	0.0	70.8	29.2	70.8	0.0	29.2	72.4	0.0	27.6
Country H - Dry Condition																		
M561	70.8	0.0	29.2	70.8	0.5	28.7				100.0	0.0	0.0	100.0	0.0	0.0			
M35A2	70.8	0.0	29.2	70.8	0.5	28.7	71.3	28.5	0.2	99.8	0.2	0.0	99.8	0.2	0.0	99.8	0.2	0.0
M813				70.8	0.0	29.2	70.8	0.5	28.7	71.3	1.1	27.6	71.3	1.1	27.6	72.4	27.4	0.2
M656				70.8	0.0	29.2	70.8	0.5	28.7	71.3	1.1	27.6	71.3	28.5	0.2	72.4	27.6	0.0
TDW901				70.8	0.0	29.2	70.8	0.0	29.2	70.8	0.0	29.2	70.8	0.0	29.2	72.4	0.0	27.6
MS20E1				70.8	1.6	27.6	71.3	1.1	27.6	71.3	1.1	27.6	71.3	1.1	27.6	72.4	0.0	27.6
M125E1							70.8	0.5	28.7	70.8	0.5	28.7				72.4	0.0	27.6
MS48E1	0.0	70.8	29.2	0.0	70.8	29.2	70.8	0.0	29.2	70.8	0.0	29.2	70.8	0.0	29.2	72.4	0.0	27.6
UET							70.8	0.0	29.2	70.8	0.0	29.2				72.4	0.0	27.6
ASV				0.0	0.0	100.0	0.0	70.8	29.2	0.0	70.8	29.2	70.8	0.0	29.2	72.4	0.0	27.6
Country I - Wet Condition																		
M561	20.6	9.1	70.2	21.0	12.2	66.8				81.3	18.7	0.0	81.3	18.7	0.0			
M35A2	6.7	22.5	70.8	9.3	22.1	68.5	33.1	48.1	18.8	81.0	0.3	18.7	81.0	0.3	18.7	81.3	0.0	18.7
M813				6.4	14.3	79.3	20.6	11.5	67.9	31.4	1.9	66.7	31.4	1.9	66.7	33.2	48.1	18.8
M656				6.4	3.3	90.4	20.7	11.5	67.9	32.1	1.2	66.7	32.1	49.2	18.8	33.2	48.0	18.7
TDW901				5.4	1.0	93.5	6.4	14.6	79.0	6.5	15.2	78.3	9.4	20.8	69.8	23.2	10.4	66.4
MS20E1				5.4	6.0	88.6	11.3	11.9	76.8	22.6	1.1	76.3	22.6	9.6	67.8	25.2	10.1	66.7
M125E1							6.3	24.8	68.9	6.4	25.1	68.5				11.8	21.4	66.8
MS48E1	1.0	23.6	75.4	19.8	5.1	75.2	24.8	0.7	74.5	24.8	15.0	60.2	24.8	15.1	60.0	30.8	11.6	57.5
UET							24.2	0.4	75.4	24.5	1.0	74.4				26.6	15.3	58.0
ASV				1.0	19.5	79.5	20.1	4.5	75.5	20.5	4.3	75.2	24.2	0.6	75.2	26.4	4.4	69.2
Country I - Dry Condition																		
M561	20.6	9.0	70.4	20.6	9.6	69.8				81.3	18.7	0.0	81.3	18.7	0.0			
M35A2	6.7	22.5	70.9	6.4	22.8	70.8	30.1	50.8	19.1	80.9	0.4	18.7	80.9	0.4	18.7	80.9	0.3	18.7
M813				6.4	14.3	79.4	20.6	9.6	69.8	29.1	1.1	69.8	29.1	1.1	69.8	30.1	50.8	19.1
M656				6.4	0.4	93.2	20.6	9.6	69.8	30.2	0.1	69.8	30.2	50.8	19.1	30.2	51.1	18.7
TDW901				5.4	1.0	93.5	6.4	14.3	79.3	6.5	15.2	78.4	6.5	23.7	69.8	20.7	9.6	69.8
MS20E1				5.4	1.0	93.5	6.4	14.3	79.3	20.7	1.0	78.3	20.7	9.5	69.8	20.7	9.5	69.8
M125E1							6.3	22.8	70.9	6.4	22.8	70.8				6.4	23.8	69.8
MS48E1	1.0	23.6	75.4	19.8	5.1	75.2	24.8	0.7	74.5	24.8	14.7	60.5	24.8	15.0	60.1	25.5	15.0	59.5
UET							24.2	0.3	75.5	24.5	1.0	74.4				24.5	15.0	60.5
ASV				1.0	19.1	79.9	20.1	4.5	75.5	20.1	4.8	75.2	24.2	0.6	75.2	24.3	1.2	74.3

Table 5

**Performance Predictions for Self-Propelled Artillery and Reference Vehicles
in the Countries Described by Generalized Terrain Data**

Vehicle	Percentage of Country with Indicated Probability of GO					
	Wet Condition			Dry Condition		
	0-33	>33-66	>66-100	0-33	>33-66	>66-100
Country A						
Self-propelled artillery						
M109A1	1.4	4.1	94.5	0.0	2.5	97.5
M107	0.0	3.8	96.2	0.0	0.1	99.9
M110E2	1.4	3.1	95.4	0.0	2.3	97.7
Other vehicles						
M113A1	2.6	15.2	82.2	2.3	13.7	84.0
M60A2	0.0	3.8	96.2	0.0	0.0	100.0
M548E1	1.5	1.8	96.7	0.0	2.3	97.7
M577A1	4.4	7.6	88.0	2.3	1.2	96.5
XM723	1.4	1.9	96.7	0.0	2.3	97.7
XM1	0.0	4.5	95.5	0.0	0.2	99.8
ASV	1.4	1.9	96.7	0.0	2.3	97.7
M561	7.3	21.2	71.5	3.3	1.2	95.5
M813	28.2	13.8	57.9	4.2	3.6	92.2
UET	0.0	2.7	97.3	0.0	0.0	100.0
Country B						
Self-propelled artillery						
M109A1	20.6	47.8	31.6	0.1	22.1	77.8
M107	0.2	66.9	32.8	0.1	0.6	99.3
M110E2	20.6	47.5	32.0	0.1	21.7	78.2
Other vehicles						
M113A1	21.5	50.4	28.1	21.5	3.6	74.8
M60A2	0.2	67.0	32.8	0.1	0.4	99.5
M548E1	20.6	47.5	32.0	0.0	21.7	78.3
M577A1	24.1	46.7	29.2	21.3	3.1	75.6
XM723	20.6	45.3	34.2	0.0	21.5	78.5
XM1	0.2	66.9	32.8	0.1	0.4	99.5
ASV	20.6	47.5	32.0	0.0	21.7	78.3
M561	86.2	2.7	11.2	75.2	1.4	23.4
M813	87.3	1.6	11.1	76.0	4.1	19.9
UET	0.2	67.3	32.5	0.1	0.8	99.1
Country C						
Self-propelled artillery						
M109	0.0	0.0	100.0	0.0	0.0	100.0
M107	0.0	0.0	100.0	0.0	0.0	100.0
M110E2	0.0	0.0	100.0	0.0	0.0	100.0
Other Vehicles						
M113A1	0.0	0.1	99.9	0.0	0.1	99.9
M60A2	0.0	0.0	100.0	0.0	0.0	100.0
M548E1	0.0	0.0	100.0	0.0	0.0	100.0
M577A1	0.0	0.0	100.0	0.0	0.0	100.0
XM723	0.0	0.0	100.0	0.0	0.0	100.0
XM1	0.0	0.0	100.0	0.0	0.0	100.0
ASV	0.0	0.0	100.0	0.0	0.0	100.0
M561	7.9	27.3	64.7	7.9	14.6	77.5
M813	13.2	23.7	63.0	9.0	14.8	76.2
UET	0.0	0.0	100.0	0.0	0.0	100.0

(Continued)

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Table 5 (Continued)

Vehicle	Percentage of Country with Indicated Probability of GO					
	Wet Condition			Dry Condition		
	0-33	>33-66	>66-100	0-33	>33-66	>66-100
<u>Country D</u>						
Self-propelled artillery						
M109A1	21.5	0.4	78.1	21.5	0.4	78.1
M107	21.5	0.0	78.5	21.5	0.0	78.5
M110E2	21.5	0.0	78.5	21.5	0.0	78.5
Other vehicles						
M113A1	57.1	3.3	39.6	57.1	3.3	39.6
M60A2	21.5	22.5	56.1	21.5	21.6	56.9
M548E1	56.5	0.6	42.9	56.5	0.6	42.9
M577A1	57.0	0.5	42.5	57.0	0.5	42.5
XM723	50.5	0.2	49.3	50.5	0.2	49.3
XM1	21.4	22.5	56.1	21.4	21.6	56.9
M561	65.5	22.5	12.0	65.5	22.5	12.0
M813	43.4	32.9	23.7	43.4	32.0	24.6
UET	21.5	3.2	75.4	21.5	3.2	75.4
<u>Country E</u>						
Self-propelled artillery						
M109A1	14.3	4.6	81.0	14.1	0.6	85.3
M107	11.6	7.1	81.3	11.6	3.1	85.3
M110E2	11.6	7.1	81.3	11.6	3.1	85.3
Other vehicles						
M113A1	32.9	12.9	54.2	32.9	8.8	58.2
M60A2	11.6	9.4	79.0	11.6	5.3	83.1
M548E1	23.0	22.3	54.7	22.9	18.4	58.7
M577A1	40.9	4.5	54.6	40.7	0.6	58.7
XM723	20.2	11.1	68.7	20.2	11.1	68.7
XM1	11.6	9.3	79.1	11.6	5.0	83.3
ASV	11.6	9.6	78.8	11.6	5.3	83.1
M561	46.0	18.3	35.7	41.9	7.9	50.1
M813	38.8	11.4	49.8	26.1	8.0	65.9
UET	14.5	4.7	80.0	14.5	0.6	85.0
<u>Country F</u>						
Self-propelled artillery						
M109A1	20.2	0.9	78.8	20.1	0.6	79.3
M107	19.9	1.1	79.0	19.9	0.8	79.3
M110E2	19.9	1.1	79.0	19.9	0.8	79.3
Other vehicles						
M113A1	70.2	1.4	28.4	70.2	1.4	28.4
M60A2	19.9	2.4	77.6	19.9	2.0	78.0
M548E1	47.2	23.1	29.6	45.3	25.0	29.6
M577A1	70.0	0.7	29.3	69.9	0.6	29.6
XM723	40.6	3.1	56.3	40.6	0.9	58.5
XM1	20.3	1.9	77.7	20.0	1.8	78.2
ASV	19.9	2.4	77.6	19.9	2.0	78.0
M561	71.3	23.5	5.2	71.2	1.5	27.2
M813	30.8	16.2	53.1	21.6	2.6	75.8
UET	20.4	0.9	78.8	20.3	0.5	79.2

(Continued)

(Sheet 2 of 3)

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Table 5 (Concluded)

Vehicle	Percentage of Country with Indicated Probability of GO					
	Wet Condition			Dry Condition		
	0-33	>33-66	>66-100	0-33	>33-66	>66-100
Country G						
Self-propelled artillery						
M109A1	0.0	0.0	100.0	0.0	0.0	100.0
M107	0.0	0.0	100.0	0.0	0.0	100.0
M110E2	0.0	0.0	100.0	0.0	0.0	100.0
Other vehicles						
M113A1	0.0	0.0	100.0	0.0	0.0	100.0
M60A2	0.0	0.0	100.0	0.0	0.0	100.0
M548E1	0.0	0.0	100.0	0.0	0.0	100.0
M577A1	0.0	0.0	100.0	0.0	0.0	100.0
XM723	0.0	0.0	100.0	0.0	0.0	100.0
XM1	0.0	0.0	100.0	0.0	0.0	100.0
ASV	0.0	0.0	100.0	0.0	0.0	100.0
M561	0.0	0.0	100.0	0.0	0.0	100.0
M813	2.7	3.5	93.8	2.7	3.5	93.8
M813	3.1	6.9	90.0	3.1	5.8	91.1
UET	0.0	0.0	100.0	0.0	0.0	100.0
Country H						
Self-Propelled artillery						
M109A1	0.0	0.0	100.0	0.0	0.0	100.0
M107	0.0	0.0	100.0	0.0	0.0	100.0
M110E2	0.0	0.0	100.0	0.0	0.0	100.0
Other vehicles						
M113A1	0.0	0.0	100.0	0.0	0.0	100.0
M60A2	0.0	0.0	100.0	0.0	0.0	100.0
M548E1	0.0	0.0	100.0	0.0	0.0	100.0
M577A1	0.0	0.0	100.0	0.0	0.0	100.0
XM723	0.0	0.0	100.0	0.0	0.0	100.0
XM1	0.0	0.0	100.0	0.0	0.0	100.0
ASV	0.0	0.0	100.0	0.0	0.0	100.0
M561	0.0	0.0	100.0	0.0	0.0	100.0
M813	70.8	0.0	29.2	70.8	0.0	100.0
M813	70.8	0.0	29.2	70.8	0.0	29.2
UET	0.0	0.0	100.0	0.0	0.0	29.2
Country I						
Self-propelled artillery						
M109A1	0.1	19.6	80.2	0.1	19.6	80.2
M107	0.1	19.6	80.2	0.1	19.6	80.2
M110E2	0.1	19.6	80.2	0.1	19.6	80.2
Other vehicles						
M113A1	20.1	0.3	79.6	20.1	0.3	79.6
M60A2	0.1	19.6	80.2	0.1	19.6	80.2
M548E1	1.0	19.1	79.9	1.0	19.1	79.9
M577A1	1.3	18.8	79.9	1.3	18.8	79.9
XM723	1.0	18.8	80.2	1.0	18.8	80.2
XM1	0.0	1.0	99.0	0.0	1.0	99.0
ASV	0.1	19.6	80.2	0.1	19.6	80.2
M561	5.7	1.0	93.2	5.7	1.0	93.2
M813	6.1	3.2	90.6	6.1	0.4	93.5
UET	18.9	1.2	79.9	18.9	1.2	79.9

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Table 6
V₉₀ Off-Road Performance Indices for Prime Mover-Towed Artillery Combinations
in the HIMO Study Areas

Prime Mover	V ₉₀ Speed, mph					
	Lightweight Artillery		Medium-Weight Artillery			Heavyweight Artillery
	3340-lb M102	4775-lb XM204	12700-lb M114A1	15250-lb XM198	16590-lb XM(130-mm)	19250-lb FH70
<u>West Germany - Wet Condition</u>						
MS61	5.4	2.7		0.5	*	
M35A2	10.9	10.8	*	2.0	*	**
M813		9.6	8.3	6.5	6.2	0.1
M656		11.3	*	3.4	*	**
TDW901		10.6	9.3	8.7	8.4	0.1
MS20E1		6.6	*	5.7	*	0.1
M125E1			*	8.1		**
MS48E1	†	3.5	*	3.5	*	0.1
UET††			*	10.0		0.1
ASV		11.2	*	10.1	*	0.1
<u>West Germany - Snow Condition</u>						
MS61	10.7	2.2		0.2	*	
M35A2	1.3	1.0	*	0.1	*	**
M813		2.8	0.6	0.5	0.4	0.3
M656		11.2	*	1.7	*	**
TDW901		11.1	9.8	9.1	8.9	8.6
MS20E1		6.6	*	5.7	*	5.5
M125E1			*	1.4		**
MS48E1	†	11.6	*	10.4	*	10.3
UET††			*	12.7		12.5
ASV		14.7	*	13.9	*	13.7
<u>Mid-East - Wet Condition</u>						
MS61	1.2	1.0		0.5	*	
M35A2	1.8	1.8	*	1.2	*	**
M813		3.9	3.8	1.8	3.4	0.1
M656		2.5	*	1.5	*	**
TDW901		10.3	9.3	8.6	8.3	0.1
MS20E1		5.4	*	4.9	*	0.1
M125E1			*	5.8		**
MS48E1	†	2.6	*	2.6	*	0.1
UET††			*	5.4		0.1
ASV		11.5	*	10.5	*	0.1
<u>Mid-East - Sand Condition</u>						
MS61	0.2	0.1		0.1	*	
M35A2	0.1	0.1	*	0.1	*	**
M813	0.1	0.1	0.1	0.1	0.1	0.1
M656		0.2	*	0.1	*	**
TDW901		0.5	0.2	0.1	0.1	0.1
MS20E1		0.6	*	0.1	*	0.1
M125E1			*	0.1		**
MS48E1	†	3.1	*	1.8	*	0.8
UET††			*	4.8		5.1
ASV		9.1	*	7.9	*	7.4

- * Performance predictions not made for indicated prime mover-M114A1 and prime mover-XM(130-mm) on detailed terrain data in order to reduce cost, but vehicle performance should be very similar to performance for prime mover-XM198.
- ** Performance predictions not made for prime mover-FH70 on detailed terrain data in order to reduce cost, but performance should be very similar to performance of M813-FH70.
- † Performance predictions not made for MS48E1-M102 on detailed terrain data in order to reduce cost, but performance should be very similar to performance for the MS48E1-XM204.
- †† Values of V₉₀ were computed using 0.5 mph for obstacle NOGO to allow for advantages of the UET's earthmoving capabilities.
- NOTE: When no performance data or explanation given, prime mover-towed artillery combination was not evaluated.

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Table 7

V₉₀ Off-Road Performance Indices for Self-Propelled Artillery and Reference

Vehicles in the HIMO Study Areas

Vehicle	V ₉₀ Speed, mph				
	West Germany		Mid-East		
	Wet Condition	Snow Condition	Wet Condition	Sand Condition	
<u>Self-propelled artillery</u>					
M109A1	11.1	14.1	11.4	9.5	
M107	10.9	14.1	11.2	9.2	
M110E2	14.4	14.0	11.2	9.3	
<u>Reference vehicles</u>					
M113A1	11.5	14.4	1.9	9.8	
M60A2	10.5	13.6	8.7	8.3	
M548E1	3.5	12.4	2.7	3.2	
M577A1	11.4	14.4	1.7	7.1	
XM723	11.9	15.7	11.9	11.6	
XM1	14.6	18.1	12.9	14.8	
ASV	11.4	15.3	11.7	10.0	
M561	11.8	12.4	1.3	0.3	
M813	10.4	8.1	6.9	0.2	
UET	12.5	16.7	11.5	11.1	

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Table 8
V₁₀₀ Speeds for Prime Mover-Towed Artillery Combinations Over Primary and Secondary Roads
and Trails in the HIMO Study Areas

Vehicle	V 100 Speed - mph									
	Lightweight Artillery			Medium-Weight Artillery			Heavyweight Artillery			
	3340-lb M102			12700-lb M141			16590-lb M141(130-mm)			
	Primary Roads	Secondary Roads	Trails	Primary Roads	Secondary Roads	Trails	Primary Roads	Secondary Roads	Trails	
M561	28.2	22.9	8.8	21.3	17.1	1.0	21.3	17.1	1.0	
M35A2	28.9	23.7	13.6	25.2	20.6	3.9	24.7	19.1	1.9	
M813				25.2	20.6	3.9	24.7	19.1	1.9	
M566				25.2	20.6	3.9	24.7	19.1	1.9	
TW9001				25.2	20.6	3.9	24.7	19.1	1.9	
M520E1				25.2	20.6	3.9	24.7	19.1	1.9	
M125E1				25.2	20.6	3.9	24.7	19.1	1.9	
M548E1				25.2	20.6	3.9	24.7	19.1	1.9	
UET				25.2	20.6	3.9	24.7	19.1	1.9	
ASV				25.2	20.6	3.9	24.7	19.1	1.9	
M561	21.3	17.5	8.9	21.3	17.1	1.0	21.3	17.1	1.0	
M35A2	21.3	17.5	8.9	21.3	17.1	1.0	21.3	17.1	1.0	
M813				21.3	17.1	1.0	21.3	17.1	1.0	
M566				21.3	17.1	1.0	21.3	17.1	1.0	
TW9001				21.3	17.1	1.0	21.3	17.1	1.0	
M520E1				21.3	17.1	1.0	21.3	17.1	1.0	
M125E1				21.3	17.1	1.0	21.3	17.1	1.0	
M548E1				21.3	17.1	1.0	21.3	17.1	1.0	
UET				21.3	17.1	1.0	21.3	17.1	1.0	
ASV				21.3	17.1	1.0	21.3	17.1	1.0	
M561	32.0	24.8	4.2	25.7	20.3	0.5	25.7	20.3	0.5	
M35A2	31.6	26.0	15.1	25.7	20.3	0.5	25.7	20.3	0.5	
M813				25.7	20.3	0.5	25.7	20.3	0.5	
M566				25.7	20.3	0.5	25.7	20.3	0.5	
TW9001				25.7	20.3	0.5	25.7	20.3	0.5	
M520E1				25.7	20.3	0.5	25.7	20.3	0.5	
M125E1				25.7	20.3	0.5	25.7	20.3	0.5	
M548E1				25.7	20.3	0.5	25.7	20.3	0.5	
UET				25.7	20.3	0.5	25.7	20.3	0.5	
ASV				25.7	20.3	0.5	25.7	20.3	0.5	
M561	31.2	20.6	0.3	23.3	18.0	0.1	23.3	18.0	0.1	
M35A2	30.9	21.2	0.2	23.3	18.0	0.1	23.3	18.0	0.1	
M813				23.3	18.0	0.1	23.3	18.0	0.1	
M566				23.3	18.0	0.1	23.3	18.0	0.1	
TW9001				23.3	18.0	0.1	23.3	18.0	0.1	
M520E1				23.3	18.0	0.1	23.3	18.0	0.1	
M125E1				23.3	18.0	0.1	23.3	18.0	0.1	
M548E1				23.3	18.0	0.1	23.3	18.0	0.1	
UET				23.3	18.0	0.1	23.3	18.0	0.1	
ASV				23.3	18.0	0.1	23.3	18.0	0.1	

* Performance predictions not made for indicated prime mover-M1441 and prime mover-M14130-mm on detailed terrain data in order to reduce cost, but vehicle performance should be very similar to performance for prime mover - Mid-East - Wet Condition.

** Performance predictions not made for prime mover-FH70 on detailed terrain data in order to reduce cost, but performance should be very similar to performance of M14130-mm and TW9001-FH70.

† Performance predictions not made for M548E1-M102 on detailed terrain data in order to reduce cost, but performance should be very similar to performance for the M548E1-M10204.

NOTE: When no performance data or explanation given, prime mover-towed artillery combination was not evaluated.

Table 9
V₁₀₀ Speeds for Self-Propelled Artillery and Reference Vehicles Over Primary and Secondary Roads
and Trails in the HIMO Study Areas

Vehicle	V ₁₀₀ Speeds, mph											
	West Germany						Mid-East					
	Wet Condition			Snow Condition			Wet Condition			Sand Condition		
	Primary Roads	Secondary Roads	Trails	Primary Roads	Secondary Roads	Trails	Primary Roads	Secondary Roads	Trails	Primary Roads	Secondary Roads	Trails
Self-propelled artillery												
M109A1	22.9	20.5	13.6	22.9	18.9	15.1	25.0	23.0	13.7	24.6	19.9	10.5
M107	22.9	20.3	13.5	22.8	18.9	15.1	24.9	23.0	13.6	24.5	19.8	10.3
M110E2	22.9	20.3	13.5	22.8	18.9	15.1	24.9	23.0	13.6	24.5	19.8	10.3
Reference vehicles												
M113A1	26.5	24.2	13.9	26.6	21.0	14.4	29.8	26.0	4.9	29.1	21.4	11.8
M60A2	22.7	20.6	14.9	22.5	18.9	16.4	24.2	22.5	15.0	23.8	19.5	11.7
M548E1	26.3	22.4	11.6	26.2	20.1	11.9	29.1	23.8	9.0	28.4	20.4	10.1
M577A1	26.4	24.0	13.9	26.5	20.9	14.4	29.7	25.9	11.3	29.0	21.3	11.5
XM723	27.2	24.6	9.8	26.9	21.2	19.2	30.3	26.3	4.4	29.6	21.4	14.2
XM1	29.0	26.9	18.3	28.2	21.7	18.9	31.9	27.4	22.0	31.1	21.5	18.9
ASV	26.7	23.2	15.8	26.5	20.6	18.7	29.8	26.2	14.9	29.1	21.3	11.5
M561	29.7	24.4	9.1	22.9	19.1	9.1	33.3	25.0	10.8	32.4	20.7	0.5
M813	27.9	23.9	4.0	12.0	11.0	7.9	30.4	26.5	11.7	29.7	21.3	0.3
UET	23.8	21.5	14.0	23.7	19.7	15.4	25.8	23.4	13.0	25.3	20.1	12.3

Table 10
Percent NOGO for Prime Mover-Towed Artillery Combinations on Primary and Secondary Roads
and Trails in the HIMO Study Areas

Prime Mover	NOGO *											
	Lightweight Artillery				Medium-Weight Artillery						Heavyweight Artillery	
	3340-lb		4775-lb		12700-lb		15250-lb		16590-lb		19250-lb	
	M102		XM204		M114A1		XM198		XM(130-mm)		FH70	
	Secondary Roads	Trails	Secondary Roads	Trails	Secondary Roads	Trails	Secondary Roads	Trails	Secondary Roads	Trails	Secondary Roads	Trails
West Germany - Wet Condition												
M561	0	0	0	1.5			0	8.6	**	**		
M35A2	0	0	0	0	**	**	0	4.4	**	**	+	+
M813			0	1.5	0	1.5	0	1.5	0	1.5	0	96.2
M656			0	0	**	**	0	1.5	**	**	+	+
TDW901			0	0	0	0	0	0	0	1.5	0	96.2
M520E1			0	1.5	**	**	0	1.5	**	**	0	96.2
M125E1					**	**	0	1.5			+	+
M548E1	††	††	0	0	**	**	0	0	**	**	0	96.2
UET					**	**	0	0			0	96.2
ASV			0	0	**	**	0	0	**	**	0	96.2
West Germany - Snow Condition												
M561	0	0	0.4	0.5			32.1	44.5	**	**		
M35A2	1.3	1.5	2.9	4.7	**	**	39.4	54.8	**	**	+	+
M813			0.4	0.5	5.2	6.1	6.1	6.5	6.5	7.0	18.1	25.9
M656			0	0	**	**	1.3	1.5	**	**	+	+
TDW901			0	0	0	0	0	0	0	0	0	0
M520E1			0	0	**	**	0	0	**	**	0	0
M125E1					**	**	1.3	1.5			+	+
M548E1	††	††	0	0	**	**	0	0	**	**	0	0
UET					**	**	0	0			0	0
ASV			0	0	**	**	0	0	**	**	0	0
Mid-East - Wet Condition												
M561	0	1.4	0	7.2			0	14.7	**	**		
M35A2	0	0	0	0.1	**	**	0	8.2	**	**	+	+
M813			0	0	0	0.1	0	0.1	0	0.1	0	98.7
M656			0	0.1	**	**	0	7.2	**	**	+	+
TDW901			0	0	0	0.1	0	0.1	0	0.1	0	98.7
M520E1			0	0	**	**	0	0.1	**	**	0	98.7
M125E1					**	**	0	0			+	+
M548E1	††	††	0	0.1	**	**	0	0.1	**	**	0	98.7
UET					**	**	0	0.1			0	98.7
ASV			0	0.1	**	**	0	0.1	**	**	0	98.7
Mid-East - Sand Condition												
M561	0	29.5	0	29.5			0	100.0	**	**		
M35A2	0	49.3	0	49.3	**	**	0	99.6	**	**	+	+
M813			0	49.3	0	99.6	0	99.6	0	99.6	0	100.0
M656			0	29.5	**	**	0	99.6	**	**	+	+
TDW901			0	15.5	0	20.3	0	99.6	0	99.6	0	99.6
M520E1			0	14.7	**	**	0	15.5	**	**	0	100.0
M125E1					**	**	0	99.6			+	+
M548E1	††	††	0	0	**	**	0	1.8	**	**	0	8.2
UET					**	**	0	0			0	0
ASV			0	0	**	**	0	0	**	**	0	0

* The M561-XM198 had 19.1 percent NOGO and the M35A2-XM198 had 22.3 percent NOGO on primary roads in West Germany with snow condition. No other prime mover-towed artillery combination had any NOGO on primary roads.

** Performance predictions not made for indicated prime mover-M114A1 and prime mover-XM9130-mm on detailed terrain data in order to reduce cost, but vehicle performance should be very similar to performance for prime mover-XM198.

† Performance predictions not made for prime mover-FH70 on detailed terrain data in order to reduce cost, but performance should be very similar to performance of M813-FH70 and TDW901-FH70.

†† Performance predictions not made for M548E1-M102 on detailed terrain data in order to reduce cost, but performance should be very similar to performance for the M548E1-XM204.

NOTE: When no performance data or explanation given, prime mover-towed artillery combination was not evaluated.

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Table 11

Percent NOGO on Primary and Secondary Roads* and Trails for Self-Propelled and Reference Vehicles in the HIMO Study Areas

<u>Vehicles</u>	<u>Trails**</u>	
	<u>West Germany Wet Condition</u>	<u>Mid-East Wet Condition</u>
Self-propelled artillery		
M109A1	0.0	0.1
M107	0.0	0.1
M110E2	0.0	0.1
Reference vehicles		
M113A1	0.0	1.4
M60A2	0.0	0.1
M548E1	0.0	0.1
M577A1	0.0	0.1
XM723	0.5	1.8
XM1	0.0	0.0
ASV	0.0	0.1
M561	0.0	0.0
M813	1.5	0.0
UET	0.0	0.1

* All self-propelled and reference vehicles were GO on 100 percent of primary and secondary roads in West Germany for both wet and snow conditions and in the Mid-East for both wet and sand conditions.

** All self-propelled and reference vehicles were GO on trails in West Germany snow condition, and all were GO on Mid-East sand condition except the M813 with 32.5 percent NOGO and M561 with 20.3 percent NOGO.

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Table 12
Percent NOGO for Prime Mover-Towed Artillery Combinations in Off-Road
Terrain in the HIMO Study Areas

Prime Mover	Lightweight Artillery		Medium-Weight Artillery			Heavyweight Artillery
	3340-1b	4775-1b	12700-1b	15250-1b	1690-1b	19250-1b
	M102	XM204	M114A1	XM198	XM(130-mm)	FH70
<u>West Germany - Wet Condition</u>						
M561	10.9	11.9		26.3	*	
M35A2	8.6	8.6	*	13.4	*	**
M813		8.9	9.6	10.2	9.8	82.7
M656		7.8	*	11.6	*	**
TDW901		5.1	5.3	6.0	6.5	81.1
MS20E1		3.8	*	4.7	*	81.0
M125E1			*	8.6		**
M548E1	†	11.7	*	11.7	*	80.6
UET			*	8.8		79.7
ASV		6.2	*	6.2	*	78.9
<u>West Germany - Snow Condition</u>						
M561	9.2	13.1		66.3	*	
M35A2	15.5	18.0	*	79.5	*	**
M813		11.9	24.1	26.4	30.1	43.6
M656		7.8	*	13.5	*	**
TDW901		4.9	5.0	5.1	5.0	5.0
MS20E1		3.1	*	3.2	*	2.5
M125E1			*	13.8		**
M548E1	†	9.5	*	9.5	*	9.5
UET			*	8.0		7.8
ASV		3.9	*	3.9	*	3.9
<u>Mid-East - Wet Condition</u>						
M561	16.9	17.7		26.9	*	
M35A2	13.9	13.9	*	16.1	*	**
M813		10.9	10.9	13.8	11.1	85.3
M656		12.7	*	15.0	*	**
TDW901		2.2	2.4	2.4	2.4	83.7
MS20E1		1.4	*	1.4	*	83.7
M125E1			*	10.2		**
M548E1	†	12.5	*	12.5	*	83.7
UET			*	13.8		83.6
ASV		2.7	*	2.7	*	83.0
<u>Mid-East - Sand Condition</u>						
M561	65.7	79.3		96.6	*	
M35A2	81.1	85.1	*	96.3	*	**
M813		81.5	95.6	96.4	96.3	96.6
M656		49.2	*	84.9	*	**
TDW901		28.9	61.6	84.2	91.3	96.4
MS20E1		23.4	*	77.0	*	96.6
M125E1			*	90.7		**
M548E1	†	11.8	*	13.6	*	19.7
UET			*	13.4		12.7
ASV		1.2	*	1.2	*	1.2

* Performance predictions not made for indicated prime mover-M114A1 and prime mover-XM(130-mm) on detailed terrain data in order to reduce cost, but vehicle performance should be very similar to performance for prime mover-XM198.

** Performance predictions not made for prime mover-FH70 on detailed terrain data in order to reduce cost but performance should be very similar to performance of M813-FH70 and TDW901-FH70.

† Performance predictions not made for M548E1-M102 on detailed terrain data in order to reduce cost, but performance should be very similar to performance for the M548E1-XM204.

NOTE: When no performance data or explanation given, prime mover-towed artillery combination were not evaluated

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Table 13

Percent NOGO for Self-Propelled Artillery and Reference
Vehicles in Off-Road Terrain in the HIMO Study Areas

<u>Vehicle</u>	<u>West Germany</u>		<u>Mid-East</u>	
	<u>Wet Condition</u>	<u>Snow Condition</u>	<u>Wet Condition</u>	<u>Sand Condition</u>
Self-propelled artillery				
M109A1	2.6	1.6	0.8	0.0
M107	4.6	3.2	6.6	6.3
M110E2	2.0	1.6	0.8	0.5
Reference vehicles				
M113A1	8.7	6.6	13.9	9.1
M60A2	0.5	2.9	9.3	0.5
M548E1	11.7	9.5	12.5	11.8
M577A1	8.8	6.6	14.6	10.3
XM723	5.4	2.4	7.9	1.2
XM1	3.1	2.3	4.0	4.0
ASV	6.2	3.9	2.7	1.2
M561	9.2	9.2	16.3	42.6
M813	8.0	7.8	10.0	62.9
UET	6.5	5.0	9.7	9.7

Table 14

Average Link Speeds (mph) for the Prime Mover-Towed Artillery Combinations in the HIMO Study Areas

Prime Mover	Lightweight Artillery				Medium-Weight Artillery				Heavyweight Artillery			
	3340-lb M102		4775-lb XM204		12700-lb M114A1		15250-lb XM198		16590-lb XM(130-mm)		19250-lb FH70	
	As-Is	Off-Road	As-Is	Off-Road	As-Is	Off-Road	As-Is	Off-Road	As-Is	Off-Road	As-Is	Off-Road
M561	13.3	1.3	11.7	1.2	West Germany - Wet Condition							
M35A2	13.0	1.2	11.2	1.1	*	5.4	0.9	*	*	*	*	*
M813			7.1	1.1	6.8	1.0	1.0	6.7	1.0	6.7	1.0	1.0
M656			14.8	1.3	*	8.6	1.0	*	*	*	*	*
TDW901			14.2	1.5	10.8	1.3	1.2	9.4	1.2	6.3	1.1	1.1
M520E1			6.4	1.1	*	6.1	1.1	*	*	*	*	*
M125E1						6.6	1.1					
M548E1	+	+	13.5	1.3	*	12.3	1.3	*	*	*	*	*
UET			14.3	1.7	*	12.9	1.4	*	*	*	*	*
ASV					*	13.6	1.6	*	*	*	*	*
West Germany - Snow Condition												
M561	12.6	1.3	8.8	1.2	*	1.8	0.7	*	*	*	*	*
M35A2	6.4	1.2	5.3	1.1	*	1.6	0.7	*	*	*	*	*
M813			6.8	1.2	4.0	3.6	1.0	3.5	0.9	2.2	0.8	0.8
M656			13.5	1.4	*	7.0	1.2	*	*	*	*	*
TDW901			12.7	1.5	11.1	10.8	1.5	10.4	1.4	10.1	1.4	1.4
M520E1			10.7	1.4	*	8.7	1.4	*	*	8.6	1.4	1.4
M125E1						5.4	1.1			*	*	*
M548E1	+	+	19.1	1.5	*	18.4	1.4	*	*	18.1	1.4	1.4
UET			21.1	1.9	*	19.0	1.6	*	*	18.8	1.6	1.6
ASV					*	20.6	1.9	*	*	20.4	1.9	1.9

(Continued)

* Performance predictions not made for indicated prime mover-M114A1 and prime mover-XM(130-mm) on detailed terrain data in order to reduce cost, but vehicle performance should be very similar to performance for prime mover-XM198.

** Performance predictions not made for prime mover-FH70 on detailed terrain data in order to reduce cost, but performance should be very similar to performance of M813-FH70 and TDW901-FH70.

+ Performance predictions not made for M548E1-M102 on detailed terrain data in order to reduce cost, but performance should be very similar to performance for the M548E1-XM204.

NOTE: When no performance data or explanation given, prime mover-towed artillery combination was not evaluated.

(Sheet 1 of 2)

Table 14 (Concluded)

Prime Mover	Lightweight Artillery				Medium-Weight Artillery				Heavyweight Artillery			
	3340-lb M102		4775-lb XM204		12700-lb M114A1		15250-lb XM198		16590-lb XM(130 mm)		19250-lb FH70	
	As-Is	Off-Road	As-Is	Off-Road	As-Is	Off-Road	As-Is	Off-Road	As-Is	Off-Road	As-Is	Off-Road
M561	4.7	1.9	4.3	1.7	Mid-East - Wet Condition				*	*	*	*
M35A2	6.6	2.3	6.6	2.3	*	*	3.4	1.5	*	*	**	**
M813			6.3	2.3	6.1	2.2	4.8	2.0	*	*	1.0	0.7
M656			7.5	2.9	*	*	5.7	2.1	6.0	2.4	**	**
TDW901			9.6	5.1	8.8	4.5	5.6	2.3	*	*	1.0	0.7
M520E1			7.2	3.4	*	*	8.4	4.2	8.2	4.2	1.0	0.7
M125E1					*	*	6.7	3.2	*	*	1.0	0.7
M548E1	+	+	8.8	3.0	*	*	7.3	3.2	*	*	**	**
UET					*	*	8.4	3.0	*	*	1.0	0.7
ASV			12.3	4.7	*	*	6.3	2.0	*	*	1.0	0.6
					*	*	11.9	4.6	*	*	1.0	0.6
Mid-East - Sand Condition												
M561	1.8	0.7	1.7	0.7	*	*	1.0	0.6	*	*	*	*
M35A2	1.5	0.7	1.4	0.7	*	*	1.0	0.6	*	*	**	**
M813			1.5	0.7	1.0	0.7	1.0	0.6	1.0	0.6	1.0	0.6
M656			1.9	0.8	*	*	1.0	0.7	*	*	**	**
TDW901			2.9	1.4	1.9	0.7	1.0	0.7	1.0	0.7	1.0	0.6
M520E1			3.1	1.5	*	*	1.8	0.7	*	*	1.0	0.6
M125E1					*	*	1.0	0.6	*	*	**	**
M548E1	+	+	8.1	3.0	*	*	5.5	2.2	*	*	4.7	2.1
UET					*	*	6.3	2.2	*	*	6.2	2.3
ASV			10.2	4.9	*	*	9.3	4.6	*	*	8.8	4.4

* Performance predictions not made for indicated prime mover-M114A1 and prime mover-XM(130-mm) on detailed terrain data in order to reduce cost, but vehicle performance should be very similar to performance for prime mover-XM198.

** Performance predictions not made for prime mover-FH70 on detailed terrain data in order to reduce cost, but performance should be very similar to performance of M813-FH70 and TDW901-FH70.

+ Performance predictions not made for M548E1-M102 on detailed terrain data in order to reduce cost, but performance should be very similar to performance for the M548E1-XM204.

Table 15

Average Link Speeds (mph) for the Self-Propelled and Reference Vehicles in
the HIMO Study Areas

Vehicles	West Germany				Mid-East			
	Wet Condition		Snow Condition		Wet Condition		Sand Condition	
	As-Is	Off-Road	As-Is	Off-Road	As-Is	Off-Road	As-Is	Off-Road
Self-propelled artillery								
M109A1	13.3	1.8	19.1	2.1	13.5	6.7	12.4	7.9
M107	13.3	1.7	19.0	1.9	11.7	5.2	10.2	5.1
M110E2	13.3	3.7	19.0	2.1	13.1	6.3	11.6	7.1
Reference vehicles								
M113A1	14.5	1.5	20.7	1.7	6.4	2.2	9.5	3.8
M60A2	13.6	2.1	19.2	2.8	9.9	3.5	11.0	5.6
M548E1	13.9	1.8	19.3	2.0	8.2	2.9	8.5	3.3
M577A1	14.6	1.5	20.7	1.7	6.2	2.1	9.0	3.3
XM723	14.6	1.7	21.8	2.1	9.1	4.3	13.9	7.8
XM1	16.0	1.7	22.2	2.0	12.8	4.5	12.7	5.5
ASV	14.5	1.6	21.3	1.9	10.7	5.1	12.5	7.0
M561	18.5	1.8	16.3	1.8	5.5	1.9	2.4	0.9
M813	7.5	1.4	9.7	1.7	8.1	2.9	1.8	0.7
UET	13.9	1.6	19.6	1.8	8.5	3.2	8.4	3.3

Table 16

Percentage of the Total Time for Traversing Links That Prime Mover-
Towed Artillery Combinations Spent Crossing Linear Features in the HIMO Study Areas

Prime Mover	Time, min					
	Lightweight Artillery		Medium-Weight Artillery			Heavyweight Artillery
	3340-lb	4775-lb	12700-lb	15250-lb	16590-lb	19250-lb
	M102	XM204	M114A1	XM198	XM(130 mm)	FH70
West Germany - Wet Condition						
M561	54.8	52.6		39.0	*	
M35A2	51.6	50.3	*	44.1	*	**
M813		48.1	46.5	45.7	45.8	28.2
M656		59.6	*	46.8	*	**
TDW901		65.4	57.3	52.3	49.4	28.2
M520E1		49.1	*	47.5	*	28.1
M125E1			*	47.7		**
M548E1	†	45.2	*	44.5	*	23.7
UET			*	50.6		23.8
ASV		58.4	*	57.4	*	24.1
West Germany - Snow Condition						
M561	57.9	53.5		31.4	*	
M35A2	51.9	49.3	*	29.5	*	**
M813		53.4	45.4	42.9	39.6	34.2
M656		61.2	*	52.8	*	**
TDW901		67.7	66.1	65.2	64.8	64.4
M520E1		63.3	*	61.1	*	60.6
M125E1			*	51.1		50.1
M548E1	†	49.6	*	50.1	*	56.8
UET			*	57.0		56.0
ASV		67.6	*	67.4	*	67.3
Mid-East - Wet Condition						
M561	3.0	2.7		2.4	*	
M35A2	3.4	3.5	*	3.2	*	**
M813		1.6	1.6	1.5	1.7	0.5
M656		2.1	*	1.7	*	**
TDW901		7.3	7.4	6.8	6.8	1.1
M520E1		2.5	*	2.3	*	0.5
M125E1			*	2.3		**
M548E1	†	2.4	*	2.6	*	0.6
UET			*	12.5		3.9
ASV		28.4	*	28.2	*	3.9
Mid-East - Sand Condition						
M561	0.5	0.5		0.5	*	
M35A2	0.5	0.5	*	0.5	*	**
M813		0.5	0.5	0.5	0.5	0.5
M656		0.6	*	0.5	*	**
TDW901		1.0	0.5	0.5	0.5	0.5
M520E1		1.1	0.5	0.5	*	0.5
M125E1			*	0.5		**
M548E1	†	0.5	*	0.4	*	0.3
UET			*	11.7		12.0
ASV		25.9	*	23.9	*	22.9

* Performance predictions not made for indicated prime mover-M114A1 and prime mover-XM9130-mm) on detailed terrain data in order to reduce cost, but vehicle performance should be very similar to performance for prime mover-XM198.

** Performance predictions not made for prime mover-FH70 on detailed terrain data in order to reduce cost, but performance should be very similar to performance of M813-FH70 and TDW901-FH70.

† Performance predictions not made for M548E1-M102 on detailed terrain data in order to reduce cost, but performance should be very similar to performance for the M548E1-XM204.

NOTE: When no performance data or explanation given, prime mover-towed artillery combination was not evaluated.

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Table 17

Percentage of the Total Time for Traversing Links That Spent Crossing
Linear Features Self-Propelled Artillery and Reference Vehicles
in the HIMO Study Areas

Vehicles	Time, min.			
	West Germany		Mid-East	
	Wet Condition	Snow Condition	Wet Condition	Sand Condition
Self-propelled artillery				
M109A1	62.7	73.8	4.8	1.7
M107	58.6	67.8	0.9	0.7
M110E2	62.0	73.1	4.3	1.0
Reference vehicles				
M113A1	50.2	58.6	6.1	5.2
M60A2	39.6	51.9	2.8	0.8
M548E1	26.9	31.0	2.6	0.6
M577A1	50.3	58.6	5.5	1.6
XM723	57.1	71.4	2.5	1.1
XM1	66.2	76.7	3.1	2.1
ASV	56.6	68.1	3.6	1.5
M561	45.2	45.5	3.2	0.7
M813	38.7	47.4	2.1	0.5
UET	53.2	62.7	19.3	16.6

Table 18

Preliminary Quantification of WHEELS Study Definitions of Tactical Mobility¹

Mobility Level	Operating Distance		Severity of Operation	
	Off-Road %	On-Road %	Off-Road* Terrain Challenged %	On-Road Trails Included %
<u>High-high mobility**</u>				
All off-road operation	100	0	100	-
<u>Tactical high mobility</u>				
The highest level of mobility designating the requirement for extensive cross-country maneuverability characteristic of operations in the ground-gaining and fire-support environment.	50	50	90	100
<u>Tactical standard mobility</u>				
The second highest level of mobility designating the requirement for occasional cross-country movement.	15	85	80	100
<u>Tactical support mobility</u>				
A level of mobility designating the requirement for infrequent off-road operations over selected terrain with the preponderance of movement on primary and secondary roads.	5	95	50	50
<u>On-road mobility**</u>				
All on superhighways, primary and secondary roads, and the best tertiary roads and trails.	0	100	-	10

* In terms of percentage of best off-road terrain to be challenged (off-road speed profile).
 ** Not a WHEELS study definition.

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Table 19

High and High-High Levels of Tactical Mobility Performance of Prime Mover-Towed Artillery
Combinations in the NIMO Study Areas

Average Speed, mph, for Specified Tactical Mobility Levels												
Prime Mover	Lightweight Artillery				Medium-Weight Artillery						Heavyweight Artillery	
	3340-lb		4775-lb		12700-lb		15250-lb		16590-lb		19250-lb	
	M102		XM204		M114A1		XM198		XM(130-mm)		FH70	
	High	High-High	High	High-High	High	High-High	High	High-High	High	High-High	High	High-High
<u>West Germany - Wet Condition</u>												
M561	5.9	0.6	3.1	0.5			0.7	0.2	*	*		
M35A2	10.8	0.7	10.8	0.7	*	*	2.4	0.5	*	*	**	**
M813			8.7	0.7	7.9	0.6	6.6	0.6	6.3	0.6	0.1	0.1
M656			10.5	0.8	*	*	3.9	0.5	*	*	**	**
TDM901			9.3	1.0	8.5	1.0	8.2	0.9	7.4	0.9	0.1	0.1
M520E1			6.3	1.2	*	*	5.6	1.0	*	*	0.1	0.1
M125E1					*	*	7.5	0.7			**	**
M548E1	†	†	4.3	0.6	*	*	4.3	0.6	*	*	0.1	0.1
UET††					*	*	9.8	2.6			0.1	0.1
ASV			10.7	1.1	*	*	9.8	0.9	*	*	0.1	0.1
<u>West Germany - Snow Condition</u>												
M561	9.5	0.6	2.5	0.5			0.2	0.1	*	*		
M35A2	1.5	0.4	1.1	0.3	*	*	0.1	0.1	*	*	**	**
M813			2.9	0.5	0.7	0.3	0.6	0.3	0.5	0.0	0.3	0.1
M656			9.7	0.7	*	*	2.1	0.5	*	*	**	**
TDM901			9.1	1.0	8.1	1.0	7.7	1.0	7.5	1.0	7.3	1.0
M520E1			6.0	1.3	*	*	5.2	1.2	*	*	5.0	1.4
M125E1					*	*	1.5	0.0			**	**
M548E1	†	†	11.0	0.7	*	*	10.0	0.7	*	*	9.9	0.7
UET††					*	*	11.3	2.7			11.1	2.7
ASV			12.4	1.3	*	*	11.8	1.3	*	*	11.7	1.3
<u>Mid-East - Wet Condition</u>												
M561	1.9	0.6	1.2	0.5			0.6	0.1	*	*		
M35A2	3.2	0.7	3.1	0.7	*	*	1.3	0.6	*	*	**	**
M813			5.9	0.8	5.7	0.8	3.1	0.7	5.1	0.8	0.1	0.1
M656			3.4	0.7	*	*	1.4	0.6	*	*	**	**
TDM901			7.2	2.9	6.7	2.6	6.3	2.5	6.2	2.5	0.1	0.1
M520E1			5.0	2.7	*	*	4.6	2.5	*	*	0.1	0.1
M125E1					*	*	5.5	0.9			**	**
M548E1	†	†	4.2	0.8	*	*	4.2	0.7	*	*	0.1	0.1
UET††					*	*	7.4	2.4			0.1	0.1
ASV			11.8	3.3	*	*	11.1	2.1	*	*	0.1	0.1
<u>Mid-East - Sand Condition</u>												
M561	0.3	0.2	0.2	0.1			0.1	0.1	*	*		
M35A2	0.1	0.1	0.1	0.1	*	*	0.1	0.1	*	*	**	**
M813			0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
M656			0.3	0.2	*	*	0.1	0.1	*	*	**	**
TDM901			0.6	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1
M520E1			0.6	0.4	*	*	0.2	0.1	*	*	0.1	0.1
M125E1					*	*	0.1	0.1			**	**
M548E1	†	†	4.8	0.8	*	*	2.4	0.7	*	*	1.0	0.5
UET††					*	*	6.2	2.3			6.2	2.3
ASV			9.0	3.3	*	*	7.8	3.1	*	*	7.3	3.0

* Performance predictions not made for indicated prime mover-M114A1 and prime mover-XM(130-mm) on detailed terrain data in order to reduce cost, but vehicle performance should be very similar to performance for prime mover-XM198.

** Performance predictions not made for prime mover-FH70 on detailed terrain data in order to reduce cost, but performance should be very similar to performance of M813-FH70.

† Performance predictions not made for M548E1-M102 on detailed terrain data in order to reduce cost, but performance should be very similar to performance for the M548E1-XM204.

†† High and high-high rating speeds were computed using 0.5 mph for obstacle NOGO to allow for advantages of the UET's earthmoving capabilities.

NOTE: WHEELS study definitions in Table 18.

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Table 20

High and High-High Levels of Tactical Mobility Performance of Self-Propelled Artillery
and Reference Vehicles in the HIMO Study Areas

Vehicle	Average Speed, mph, for Specified Tactical Mobility Levels							
	West Germany				Mid-East			
	Wet Condition		Snow Condition		Wet Condition		Sand Condition	
	High	High-High	High	High-High	High	High-High	High	High-High
Self-propelled artillery								
M109A1	10.1	1.7	11.4	2.4	12.6	5.5	10.4	8.4
M107	10.1	1.1	11.6	1.5	12.8	1.3	10.2	1.4
M110E2	10.0	1.5	11.3	2.4	12.5	5.5	10.2	5.7
Reference vehicles								
M113A1	11.4	0.7	12.6	0.9	2.8	0.7	12.2	1.0
M60A2	10.9	1.1	12.2	1.7	11.0	1.0	10.0	5.1
M548E1	4.9	0.6	12.6	0.8	4.2	0.7	5.0	0.8
M577A1	11.3	0.7	12.6	0.9	2.9	0.7	9.1	0.9
XM723	11.0	1.0	12.9	1.9	7.5	1.1	13.2	4.6
XM1	13.1	1.6	14.0	2.0	16.2	2.0	16.7	2.1
ASV	11.0	0.9	12.7	1.3	13.3	2.7	11.2	4.3
M561	11.6	0.7	11.3	0.7	2.3	0.6	0.4	0.2
M813	9.7	0.8	7.2	0.7	9.0	0.9	0.3	0.2
UET*	11.8	3.6	13.5	3.9	11.6	2.7	11.2	2.8

* High and high-high rating speeds were computed using 0.5 mph for obstacle NOGO to allow for advantages of the UET's earthmoving capabilities.

NOTE: WHEELS study definitions quantified per Table 18.

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Table 21

Comparison of Performances of Individual Vehicles and Selected Vehicle Groups on Primary
Roads, Secondary Roads, Trails and Off-Road in the HIMO Study Areas

Vehicle Groups	Wet Condition					Snow or Sand Condition*				
	Vehicles Traveling Independently		Vehicle Group Traveling Together			Vehicles Traveling Independently		Vehicle Group Traveling Together		
	Speed**	NOGO	Speed**	NOGO	Distance†	Speed**	NOGO	Speed	NOGO	Distance†
	mph	%	mph	%	%	mph	%	mph	%	%
<u>West Germany - Primary Roads</u>										
Group 1			22.9	0				22.9	0	
M109A1	22.9	0			92.0	22.9	0			82.0
M548E1	26.3	0			5.0	26.2	0			9.0
M577A1	26.4	0			13.0	26.5	0			27.0
Group 2			24.6	0				7.4	0	
M813-XM198	24.6	0			92.0	7.4	0			87.0
M561	29.7	0			15.0	22.9	0			15.0
Group 3			25.1	0				25.1	0	
M548E1-XM198	25.1	0			92.0	25.1	0			79.0
M577A1	26.4	0			15.0	26.5	0			29.0
Group 4			25.1	0				22.8	0	
M548E1-XM198	25.1	0			92.0	25.1	0			20.0
M561	29.7	0			15.0	22.9	0			88.0
<u>West Germany - Secondary Roads</u>										
Group 1			20.3	0				18.8	0	
M109A1	20.5	0			55.0	18.9	0			62.0
M548E1	22.4	0			41.0	20.1	0			40.0
M577A1	24.0	0			29.0	20.9	0			20.0
Group 2			19.6	0				1.3	6.1	
M813-XM198	20.2	0			60.0	1.3	6.1			98.0
M561	24.4	0			53.0	19.1	0			6.0
Group 3			19.4	0				18.7	0	
M548E1-XM198	19.4	0			84.0	18.7	0			66.0
M577A1	24.0	0			28.0	20.9	0			45.0
Group 4			19.4	0				18.0	0	
M548E1-XM198	19.4	0			84.0	18.7	0			60.0
M561	24.4	0			28.0	19.1	0			51.0
<u>West Germany - Trails</u>										
Group 1			11.2	0				11.8	0	
M109A1	13.6	0			26.0	15.1	0			18.0
M548E1	11.6	0			84.0	11.9	0			93.0
M577A1	13.9	0			11.0	14.4	0			11.0
Group 2			3.8	1.5				1.2	6.5	
M813-XM198	3.9	1.5			27.0	1.2	6.5			72.0
M561	9.1	0			81.0	9.1	0			32.0
Group 3			10.2	0				11.6	0	
M548E1-XM198	10.2	0			100.0	11.6	0			100.0
M577A1	13.9	0			10.0	14.4	0			11.0
Group 4			8.2	0				8.9	0	
M548E1-XM198	10.2	0			45.0	11.6	0			32.0
M561	9.1	0			64.0	9.1	0			76.0
<u>West Germany - Off-Road</u>										
Group 1			3.0	12.1				11.7	9.7	
M109A1	11.1	2.6			43.0	14.1	1.6			44.0
M548E1	3.5	11.7			55.0	12.4	9.5			62.0
M577A1	11.4	8.8			25.0	14.4	6.6			17.0
Group 2			3.9	11.1				0.5	27.1	
M813-XM198	6.5	10.2			80.0	0.5	26.4			93.0
M561	11.8	9.2			32.0	12.4	9.2			18.0
Group 3			3.3	11.7				10.4	9.5	
M548E1-XM198	3.5	11.7			70.0	10.4	9.5			91.0
M577A1	11.4	8.8			39.0	14.4	6.6			19.0
Group 4			3.2	11.7				6.1	10.6	
M548E1-XM198	3.5	11.7			75.0	10.2	9.5			70.0
M561	11.8	9.2			36.0	12.4	9.2			43.0

(Continued)

* West Germany - snow; Mid-East - sand.

** Speed of vehicle on primary and secondary roads and trails is V_{100} , and off-road is V_{90} .

† Percentage of total traverse limited by indicated vehicle.

(Sheet 1 of 2)

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Table 21 (Concluded)

Vehicle Groups	Wet Condition					Snow or Sand Condition*				
	Vehicles Traveling Independently		Vehicle Group Traveling Together			Vehicles Traveling Independently		Vehicle Group Traveling Together		
	Speed**	NOGO	Speed**	NOGO	Distance†	Speed**	NOGO	Speed	NOGO	Distance†
	mph	%	mph	%	%	mph	%	mph	%	%
Mid-East - Primary Roads										
Group 1			25.0	0				24.6	0	
M109A1	25.0	0			98.0	24.6	0			94.0
M548E1	29.1	0			3.0	28.4	0			11.0
M577A1	29.1	0			5.0	29.0	0			17.0
Group 2			27.2	0				26.7	0	
M813-XM198	27.2	0			98.0	26.7	0			89.0
M561	33.0	0			11.0	32.4	0			22.0
Group 3			27.7	0				27.2	0	
M548E1-XM198	27.7	0			98.0	27.2	0			88.0
M577A1	29.7	0			11.0	29.0	0			23.0
Group 4			27.7	0				27.7	0	
M548E1-XM198	27.7	0			98.0	27.2	0			88.0
M561	33.3	0			11.0	32.4	0			23.0
Mid-East - Secondary Roads										
Group 1			22.7	0				19.6	0	
M109A1	23.0	0			37.0	19.9	0			56.0
M548E1	23.8	0			48.0	20.4	0			41.0
M577A1	25.9	0			33.0	21.3	0			14.0
Group 2			23.6	0				20.0	0	
M813-XM198	23.6	0			52.0	20.0	0			65.0
M561	25.0	0			55.0	20.7	0			40.0
Group 3			23.4	0				20.1	0	
M548E1-XM198	23.5	0			76.0	20.1	0			70.0
M577A1	25.9	0			33.0	21.3	0			35.0
Group 4			23.5	0				20.0	0	
M548E1-XM198	23.5	0			76.0	20.0	0			70.0
M561	25.0	0			33.0	20.7	0			35.0
Mid-East - Trails										
Group 1			9.0	0.1				9.3	0	
M109A1	13.7	0.1			19.0	10.5	0			43.0
M548E1	9.0	0.1			85.0	10.1	0			58.0
M577A1	11.3	0.1			6.0	11.5	0			7.0
Group 2			8.7	0.1				0.1	99.6	
M813-XM198	9.6	0.1			25.0	0.1	99.6			100.0
M561	10.8	0			80.0	0.5	20.3			1.0
Group 3			8.4	0.1				3.0	1.8	
M548E1-XM198	11.0	0.1			98.0	3.0	1.8			100.0
M577A1	11.3	0.1			7.0	11.5	0			3.0
Group 4			9.2	0.1				0.5	20.3	
M548E1-XM198	11.0	0.1			45.0	3.0	1.8			54.0
M561	10.8	0			60.0	0.5	20.3			48.0
Mid-East - Off-Road										
Group 1			1.4	15.7				2.7	12.2	
M109A1	11.1	0.8			22.0	9.5	0			38.0
M548E1	2.7	12.5			61.0	3.2	11.8			54.0
M577A1	1.1	14.6			27.0	7.1	10.3			18.0
Group 2			1.2	16.5				0.1	96.4	
M813-XM198	1.8	13.8			95.0	0.1	96.4			100.0
M561	1.3	16.3			9.0	0.3	42.6			3.0
Group 3			1.3	15.7				1.6	14.0	
M548E1-XM198	2.6	12.5			73.0	1.8	13.6			97.0
M577A1	1.7	14.6			31.0	7.1	10.3			7.0
Group 4			1.1	17.6				0.3	43.9	
M548E1-XM198	2.6	12.5			70.0	1.8	13.6			61.0
M561	1.3	16.3			37.0	0.3	42.6			43.0

Table 22

**Relative Mobility Performance of Prime Movers Based on Performance in Countries
Described by the Generalized Terrain Data**

Comparison Vehicles	Country															
	A		B		C		D		E		F		G		H	
	GO of Best % Vehicle	Percent % Vehicle	GO of Best % Vehicle	Percent % Vehicle	GO of Best % Vehicle	Percent % Vehicle	GO of Best % Vehicle	Percent % Vehicle	GO of Best % Vehicle	Percent % Vehicle	GO of Best % Vehicle	Percent % Vehicle	GO of Best % Vehicle	Percent % Vehicle	GO of Best % Vehicle	Percent % Vehicle
Group 1: Prime Movers Towing Lightweight Artillery (XM204)																
Wet Condition																
ASV	95.2	100	31.2	100	99.9	100	47.7	100	64.4	95	58.5	76	99.3	100	100.0	100
TDW901	71.6	75	14.5	46	87.5	88	41.3	87	67.6	100	76.7	100	93.8	95	29.2	29
MS48E1	93.1	98	20.1	64	87.5	88	28.2	59	53.7	79	28.6	37	94.3	95	29.2	29
M656	62.0	65	12.6	40	85.8	86	33.4	70	59.2	88	57.9	75	90.0	91	29.2	29
MS20E1	44.1	46	11.1	36	62.7	63	23.5	49	49.1	73	50.4	66	90.0	91	27.6	28
M813	41.1	43	3.9	13	50.0	50	16.0	34	39.3	58	46.0	60	63.7	64	29.2	29
M35A2	30.5	32	2.4	8	32.5	33	6.5	14	24.7	37	4.1	6	61.7	62	28.7	29
M561	17.0	18	0.5	2	5.7	6	0.9	2	17.3	26	2.2	3	33.0	33	28.7	29
Group 1: Prime Movers Towing Lightweight Artillery (XM204)																
Dry Condition																
TDW901	95.5	98	24.8	32	87.5	88	42.2	86	71.8	100	77.1	100	93.8	94	29.2	29
ASV	97.7	100	77.6	100	100.0	100	48.9	100	68.6	96	58.6	76	98.4	100	100.0	100
M656	91.2	94	20.5	26	86.2	86	33.4	68	65.0	91	57.9	75	91.1	92	29.2	29
MS48E1	96.3	99	24.8	32	87.5	88	28.2	58	57.8	81	28.7	37	94.3	95	29.2	29
MS20E1	89.3	91	19.9	26	76.1	76	24.5	50	65.6	91	75.0	98	91.1	92	27.6	28
M813	58.8	60	9.0	12	54.3	54	16.0	33	52.0	72	57.2	74	63.7	64	29.2	29
M35A2	55.0	56	8.4	11	45.4	45	6.5	13	39.3	55	26.5	34	63.7	64	28.7	29
M561	40.2	41	2.9	4	5.9	6	0.9	2	23.9	33	2.9	4	39.2	39	28.7	29
Group 2: Prime Movers Towing Medium-Weight Artillery (XM198)																
Wet Condition																
ASV	78.0	100	15.1	100	87.5	100	34.7	100	58.4	100	57.6	100	93.8	100	29.2	100
UET	71.5	91	12.3	81	63.1	72	17.9	52	45.1	77	32.8	57	93.8	100	29.2	100
TDW901	32.0	41	2.4	16	9.0	10	8.2	24	34.2	59	33.7	59	42.6	45	29.2	100
M125E1	25.6	32	2.4	16	30.4	35	12.5	36	34.2	59	31.2	54	61.7	66	28.7	98
MS20E1	18.8	24	1.8	12	7.1	8	7.3	21	33.2	57	29.4	51	42.6	45	27.6	95
MS48E1	36.8	47	3.6	24	30.9	35	6.0	17	24.4	42	3.0	1	61.7	66	29.2	100
M656	9.8	12	0.5	3	5.4	6	1.0	3	23.6	40	24.4	42	33.0	35	27.6	95
M813	9.8	12	0.5	3	5.4	6	1.0	3	23.7	41	24.5	43	33.0	35	27.6	95
M35A2	0.0	0	0.0	0	0.0	0	0.0	0	0.2	1	0.0	0	0.0	0	0.0	0
M561	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Group 2: Prime Movers Towing Medium-Weight Artillery (XM198)																
Dry Condition																
ASV	95.5	100	24.8	100	87.5	100	34.7	100	62.6	100	57.7	100	93.8	100	29.2	100
UET	95.5	100	19.1	77	63.1	72	17.9	52	45.2	72	32.8	57	93.8	100	29.2	100
TDW901	44.7	47	8.4	34	21.8	25	8.2	24	48.6	78	55.9	97	42.6	45	29.2	100
M125E1	54.3	57	8.4	34	44.1	50	12.5	36	49.0	78	56.0	97	63.7	68	28.7	98
MS20E1	41.8	44	4.0	16	7.3	8	7.3	21	33.8	54	32.2	56	42.6	45	27.6	98
MS48E1	55.2	58	4.0	16	30.9	35	6.0	17	24.5	39	3.1	1	63.7	68	29.2	100
M656	37.5	39	2.9	12	21.8	25	1.0	3	30.7	49	27.1	47	39.2	42	27.6	95
M813	37.6	39	2.9	12	5.8	7	1.0	3	30.7	49	27.3	47	39.2	42	27.6	95
M35A2	0.0	0	0.0	0	0.0	0	0.0	0	0.2	1	0.1	1	0.0	0	0.0	0
M561	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Group 3: Prime Movers Towing Heavyweight Artillery (FH70)																
Wet Condition																
ASV	40.0	100	12.9	100	60.9	100	6.2	85	39.7	100	27.1	93	75.4	100	27.6	100
UET	23.7	59	3.6	28	28.8	47	7.3	100	33.3	84	29.2	100	49.2	65	27.6	100
M125E1	9.8	25	1.2	9	7.1	12	1.5	21	23.9	60	26.2	90	33.0	44	27.6	100
MS20E1	9.8	25	0.5	4	5.4	9	1.0	14	23.6	59	24.4	84	33.0	44	27.6	100
MS48E1	17.8	45	3.6	28	7.1	12	0.8	11	23.3	59	2.5	9	42.6	56	27.6	100
TDW901	4.2	11	0.5	4	0.7	1	0.5	7	21.0	53	24.4	84	31.4	42	27.6	100
M813	2.9	7	0.0	0	0.0	0	0.0	0	2.9	7	0.1	1	11.6	15	0.2	1
M656	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
M35A2	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Group 3: Prime Movers Towing Heavyweight Artillery (FH70)																
Dry Condition																
ASV	85.9	100	19.9	100	75.0	100	8.6	89	56.4	100	51.8	100	90.8	100	27.6	100
UET	52.6	61	4.0	20	29.7	40	9.7	100	34.0	60	31.9	62	63.5	70	27.6	100
M125E1	37.6	44	7.3	37	20.3	27	1.5	15	45.2	80	51.2	99	39.2	43	27.6	100
MS20E1	37.6	44	2.9	15	5.8	8	1.0	10	30.7	54	27.2	53	39.2	43	27.6	100
MS48E1	40.9	48	4.0	20	7.3	10	0.8	8	23.7	42	3.0	6	42.6	47	27.6	100
TDW901	31.4	37	2.9	15	2.4	3	0.5	5	30.2	54	27.1	52	39.1	43	27.6	100
M813	16.2	19	0.0	0	1.5	2	0.0	0	5.6	10	0.0	0	13.1	14	0.2	1
M656	0.0	0	0.0	0	0.0	0	0.0	0	0.2	1	0.0	0	0.0	0	0.0	0
M35A2	0.0	0	0.0	0	0.0	0	0.0	0	0.1	1	0.0	0	0.0	0	0.0	0

* Percentage of country with >66-100 percent probability of GO.

** Vehicle that can negotiate the largest percentage of country is considered "Best Vehicle".

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Table 23

Comparisons of Selected Prime Mover-Towed Artillery with Self-Propelled M109A1
Based on Performance in Countries Described by the Generalized Terrain Data

Comparison Vehicles	Country															
	A				B				C				D			
	GO	S.P.	%**	%	GO	S.P.	%	%	GO	S.P.	%	%	GO	S.P.	%	%
Prime Movers Towing Lightweight Artillery																
Wet Condition																
ASV-XM204	95.2	101.0	31.2	99.0	99.0	87.5	100.0	47.7	61.0	64.4	80.0	58.5	74.0	99.3	99.0	100.0
TDW901-XM204	71.6	76.0	14.5	46.0	87.5	88.0	41.3	53.0	67.6	83.0	76.7	97.0	93.8	94.0	29.2	29.0
M561-XM204	17.0	18.0	0.5	2.0	5.7	6.0	0.9	1.0	17.3	21.0	2.2	3.0	33.0	33.0	28.7	29.0
Prime Movers Towing Medium-Weight Artillery																
Wet Condition																
ASV-XM198	78.9	83.0	15.1	48.0	87.5	88.0	34.7	44.0	58.4	72.0	57.6	73.0	93.8	94.0	29.2	29.0
TDW901-XM198	32.0	34.0	2.4	8.0	9.0	9.0	8.2	10.0	34.2	42.0	33.7	43.0	42.6	43.0	29.2	29.0
M656-XM198	9.8	10.0	0.5	2.0	5.4	5.0	1.0	1.0	23.6	29.0	24.4	31.0	33.0	33.0	27.6	28.0
Prime Movers Towing Heavyweight Artillery																
Wet Condition																
ASV-FH70	40.0	42.0	12.9	41.0	60.9	61.0	6.2	8.0	39.7	49.0	27.1	34.0	75.4	75.0	27.6	28.0
M125E1-FH70	9.8	10.0	1.2	4.0	7.1	7.0	1.5	2.0	23.9	30.0	26.2	33.0	33.0	33.0	27.6	28.0
M520E1-FH70	9.8	10.0	0.5	2.0	5.4	5.0	1.0	1.0	23.6	29.0	24.4	31.0	33.0	33.0	27.6	28.0
Prime Movers Towing Lightweight Artillery																
Dry Condition																
ASV-XM204	97.7	100.0	77.6	100.0	100.0	100.0	48.9	63.0	68.6	80.0	58.6	74.0	99.4	99.0	100.0	100.0
TDW901-XM204	95.5	98.0	24.8	32.0	87.5	88.0	42.2	54.0	71.8	84.0	77.1	97.0	93.8	94.0	29.2	29.0
M561-XM204	40.2	41.0	2.9	4.0	5.9	6.0	0.9	1.0	23.9	28.0	2.9	4.0	39.2	39.0	28.7	29.0
Prime Movers Towing Medium-Weight Artillery																
Dry Condition																
ASV-XM198	95.5	98.0	24.8	32.0	87.5	88.0	34.7	44.0	62.6	73.0	57.7	73.0	93.8	94.0	29.2	29.0
TDW901-XM198	44.7	46.0	8.4	11.0	21.8	22.0	8.2	10.0	48.6	57.0	55.9	70.0	42.6	43.0	29.2	29.0
M656-XM198	37.5	38.0	2.9	4.0	21.8	22.0	1.0	1.0	30.7	36.0	27.1	34.0	39.2	39.0	27.6	28.0
Prime Movers Towing Heavyweight Artillery																
Dry Condition																
ASV-FH70	85.9	88.0	19.9	26.0	75.0	75.0	8.6	11.0	56.4	66.0	51.8	65.0	90.8	91.0	27.6	28.0
M125E1-FH70	37.6	39.0	7.3	9.0	20.3	20.0	1.5	2.0	45.2	53.0	51.2	65.0	39.2	39.0	27.6	28.0
M520E1-FH70	37.6	39.0	2.9	4.0	5.8	6.0	1.0	1.0	30.7	36.0	27.2	34.0	39.2	39.0	27.6	28.0

* Percentage of country with >66-100 percent probability of GO.

** Performance of prime mover-towed artillery compared with self-propelled M109A1 in percent.

Table 24

Relative Mobility of Prime Movers Based on Tactical High Mobility Level in HIMO Study Areas

Prime Mover	West Germany				Mid-East			
	Wet Condition		Snow Condition		Wet Condition		Sand Condition	
	High Rating Speed, mph	Percent of Best Vehicle Speed	High Rating Speed, mph	Percent of Best Vehicle Speed	High Rating Speed, mph	Percent of Best Vehicle Speed	High Rating Speed, mph	Percent of Best Vehicle Speed
M561	3.1	29	2.5	20	1.2	10	0.2	2
M35A2	10.8	100	1.1	9	3.1	26	0.1	*
M813	8.7	81	2.9	23	5.9	50	0.1	*
M656	10.5	97	9.7	78	3.4	29	0.3	3
TDW901	9.3	86	9.1	73	7.2	61	0.6	7
M520E1	6.3	58	6.0	48	5.0	42	0.6	7
M548E1	4.3	40	11.0	89	4.2	36	4.8	53
ASV	10.7	99	12.4	100	11.8	100	9.0	100
<u>XM204</u>								
M561	0.7	7	0.2	2	0.6	5	0.1	*
M35A2	2.4	24	0.1	*	1.3	12	0.1	*
M813	6.6	67	0.6	5	3.1	28	0.1	*
M656	3.9	40	2.1	18	1.4	13	0.1	*
TDW901	8.2	84	7.7	65	6.3	57	0.1	*
M520E1	5.6	57	5.2	44	4.6	41	0.2	3
M125E1	7.5	77	1.5	13	5.5	50	0.1	*
M548E1	4.3	44	10.0	85	4.2	38	2.4	31
UET	9.8	100	11.3	96	7.4	67	6.2	79
ASV	9.8	100	11.8	100	11.1	100	7.8	100
<u>XM198</u>								
M813	0.1	*	0.3	3	0.1	*	0.1	*
TDW901	0.1	*	7.3	62	0.1	*	0.1	*
M520E1	0.1	*	5.0	43	0.1	*	0.1	*
M548E1	0.1	*	9.9	85	0.1	*	1.0	14
UET	0.1	*	11.1	95	0.1	*	6.2	85
ASV	0.1	*	11.7	100	0.1	*	7.3	100
<u>FH70**</u>								

* A 0.1-mph speed indicates that this prime mover is completely inadequate for towing this given artillery in given country and condition.

** No performance predictions were made for the M35A2 and the M125E1 towing the FH70, but they should have performance similar to that of the M813 towing the FH70.

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Table 25

Comparisons of Selected Prime Mover-Towed Artillery and the M109A1 at Two Levels of Mobility
in the HIMO Study Areas

Vehicles	West Germany				Mid-East			
	High*	M109A1 High	High- High*	M109A1 High-High	High	M109A1 High	High-High	M109A1 High-High
ASV-XM204	10.7	106	1.1	65	11.8	94	3.3	60
TDW901-XM204	9.3	92	1.0	59	7.2	57	2.9	53
M561-XM204	3.1	31	0.5	29	1.2	10	0.5	9
MS48E1-XM204	4.3	43	0.6	35	4.2	33	0.8	15
Group 2 - Wet Condition								
ASV-XM198	8.2	81	0.9	53	6.3	50	2.5	45
TDW901-XM198	3.9	39	0.5	29	1.4	11	0.6	11
M561-XM198	4.3	43	0.6	35	4.2	33	0.7	13
Group 3 - Wet Condition								
ASV-FH70	0.1	1	0.1	6	0.1	1	0.1	2
TDW901-FH70	0.1	1	0.1	6	0.1	1	0.1	2
MS20E1-FH70	0.1	1	0.1	6	0.1	1	0.1	2
MS48E1-FH70	0.1	1	0.1	6	0.1	1	0.1	2
Group 1 - Snow or Sand Condition**								
ASV-XM204	12.4	109	1.3	54	9.0	87	3.3	39
TDW901-XM204	9.1	80	1.0	42	0.6	6	0.3	4
M561-XM204	2.5	22	0.5	21	0.2	2	0.1	1
MS48E1-XM204	11.0	96	0.7	29	4.8	46	0.8	10
Group 2 - Snow or Sand Condition**								
ASV-XM198	11.8	104	1.3	54	7.8	75	3.1	57
TDW901-XM198	7.7	68	1.0	42	0.1	1	0.1	1
M561-XM198	2.1	18	0.5	21	0.1	1	0.1	1
MS48E1-XM198	10.0	88	0.7	29	2.4	23	0.7	8
Group 3 - Snow or Sand Condition**								
ASV-FH70	11.7	103	1.3	54	7.3	70	3.0	56
TDW901-FH70	7.3	64	1.0	42	0.1	1	0.1	1
M520E1-FH70	5.0	44	1.4	58	0.1	1	0.1	1
MS48E1-FH70	9.9	87	0.7	29	1.0	10	0.5	6

* WHEELS study definitions in Table 18, and mph.

** West Germany snow condition; Mid-East sand condition.

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Table 26

Ranking of Selected Vehicle Groups Based on Performance in the HIMO Study Areas

Surface Type	Group No. *	West Germany				Mid-East			
		Wet		Snow		Wet		Sand	
		Group** Speed mph	Rank†	Group Speed mph	Rank	Group Speed mph	Rank	Group Speed mph	Rank
Primary roads	1	22.9	4	22.9	2	25.0	4	24.6	4
	2	24.6	3	7.4	4	27.2	3	26.7	3
	3	25.1	1	25.1	1	27.7	1	27.2	1
	4	25.1	1	22.8	3	27.7	1	27.2	1
Secondary roads	1	20.3	1	18.8	1	22.7	4	19.6	4
	2	19.6	2	1.3	4	23.6	1	20.0	2
	3	19.4	3	18.7	2	23.4	3	20.1	1
	4	19.4	3	18.0	3	23.5	2	20.0	2
Trails	1	11.2	1	11.8	1	9.0	2	9.3	1
	2	3.8	4	1.2	4	8.7	3	0.1	4
	3	10.2	2	11.6	2	8.4	4	3.0	2
	4	8.2	3	8.9	3	9.2	1	0.5	3
Off-roads	1	3.0	4	11.7	1	1.4	1	2.7	1
	2	3.9	1	0.5	4	1.2	3	0.1	4
	3	3.3	2	10.4	2	1.3	2	1.6	2
	4	3.2	3	6.1	3	1.1	4	0.3	3

* Group 1 = M109A1, M548E1, M577A1

Group 2 = M813-XM198, M561

Group 3 = M548E1-XM198, M577A1

Group 4 = M548E1-XM198, M561

** Group speed for primary and secondary roads and trails based on V_{100} and for off-road on V_{90} .

† Ranked 1-4, best to worst

APPENDIX A: JIFFY MOBILITY MODEL

1. The JIFFY mobility model was developed for use with generalized terrain data because a limited amount of detail with respect to terrain data does not warrant the use of a more complex model, such as the Army mobility model (AMM). The terrain-vehicle relations used by the JIFFY mobility model to predict GO/NOGO vehicle performance are soil-vehicle, soil strength-slope-vehicle, obstacle-vehicle geometry, and vegetation-vehicle. These relations and the method used to determine GO/NOGO by the JIFFY model are discussed briefly in this appendix.

Terrain-Vehicle Relations

Soil-vehicle relations

2. Vehicle performance varies as a function of soil type therefore, separate relations for surface material strength versus vehicle parameters were used for fine-grained soils (clays and silts) and coarse-grained soils (sands). Fine-grained soil-vehicle relations are also used for rock surfaces. Fine-grained soil was the predominant surface material in the nine countries considered in this study. Coarse-grained soil occurred in relatively few of the terrain units.

3. The soil-vehicle relations used by the JIFFY model to predict vehicle performance include the minimum soil strength required for a vehicle to complete one pass and the first-pass maximum tractive force (drawbar pull).

4. VCI_1 . For fine-grained soils, VCI_1 is defined as the minimum soil strength in terms of rating cone index (RCI) that will permit one pass. The generalized terrain data describe soil strength only in terms of cone index; therefore, it is assumed that rating cone index and cone index are the same. For coarse-grained soils, VCI_1 is computed and defined as the soil strength in terms of cone index at which zero net drawbar pull occurs. The procedures for computing VCI_1 for both fine-grained and coarse-grained soils are the same as those used in the AMC-74X mobility model.²

5. VCI_1 for vehicles towing artillery can be computed by adding the increase in motion resistance offered by the artillery for a given soil strength, and then determining the increase in soil strength required to offset the motion resistance, using the soil strength-drawbar pull relations.

6. Traction force-soil strength relations. The maximum force a vehicle can develop on level ground is primarily a function of soil strength, and vehicle type (wheeled or tracked), ground pressure, and slip. Tractive force versus excess rating cone index (RCI minus VCI_1) relations for tracked and wheeled vehicles operating in fine-grained soils are shown in Figure A1.

7. For this study, tractive force in fine-grained soil for wheeled vehicles was predicted for the soil strength values (150, 112, 60, and 22) representative of the surface composition classes given in Table D1 (Appendix D). Strength of coarse-grained soil has little or no effect on tractive performance, but the type of track on a vehicle does affect tractive performance. For the vehicles in this study with flexible tracks, a tractive force coefficient of 0.70 was assigned; for vehicles with girderized tracks, a tractive force coefficient of 0.57 was assigned. Although this may appear somewhat arbitrary, previous studies have shown these values to be reasonable.

Soil strength-slope-vehicle relations

8. Vehicle performance on a slope depends largely on the magnitude of the slope and the excess traction that the vehicle can develop, which, in turn, depends on soil strength. For a given soil strength the maximum slope negotiable (expressed in percent) is equal to the tractive force (expressed as percent of vehicle weight) that a vehicle can develop on level soil of the same strength. Thus, the tractive force-soil strength relations for fine-grained soils (Figure A1) and the computational form for determining tractive force for coarse-grained soils (Figure A2) are used to determine performance on slopes.

Obstacle-vehicle geometry relations

9. The only obstacle geometry characteristics available in the generalized terrain data are the heights of the obstacles. By using

pertinent obstacle-vehicle geometry, the maximum attitude angle that the vehicle would attain if it were to cross the obstacle and the traction required are determined.

10. To use limited available data to predict traction required by wheeled vehicles for obstacle crossing, the obstacle approach angle (A) was arbitrarily assumed to vary with obstacle height as follows:

$$A = 90 - \frac{OH}{2}, \text{ deg}$$

where OH = obstacle height, in.

This was done on the basis that, as discrete natural obstacles become larger, they tend under the influence of both their origin and subsequent history to become less abrupt. The algorithm allows small obstacles to present essentially vertical faces to a vehicle approach, whereas, the obstacle approach angle drops to about 70 deg for the largest vertical obstacles considered. This is still formidable.

11. Tractive requirements for wheeled vehicles are computed on the following assumptions:

- a. The obstacle is rigid.
- b. The obstacle is approached head-on at very low speed.
- c. Load is equally distributed among the driving axles, and load transfer due to vehicle attitude is ignored.
- d. Tractive coefficient is the same under each axle and on the obstacle face.

The resulting simple static equilibrium equations lead to an equation for required tractive coefficient (T_R) as follows:

$$T_R = \sqrt{\lambda^2 + \frac{1}{n-1}} - \lambda$$

where

$$\lambda = \frac{1}{2(n-1)} \times \cot \alpha$$

n = total number of driven axles

α = effective wheel contact angle

= A or A_1 , whichever is least

$$A_1 = 90 - \arcsin\left(\frac{RW}{OH}\right), \text{ deg}$$

RW = wheel radius, in.

12. For tracked vehicles the traction required to surmount the obstacles that can be negotiated is computed with the following equations:

$$\text{Traction required (\% of vehicle weight)} = \tan (\text{MPA})$$

where

MPA = maximum pitch angle of vehicle (deg)

$$= \arcsin [MV \div (LT - DS)]$$

MV = obstacle height, in.

LT = length of tractive element in contact with ground, in.

DS = distance between center of first road wheel and center of road wheel just forward of center of gravity of the vehicle, in.

The values determined in this manner for tractive force required are computed as percent of vehicle weight.

Vegetation-vehicle relations

13. Although both woody and nonwoody vegetation are deterrents to vehicle performance by restricting the driver's visibility or by causing the vehicle to slow down to maneuver around or override single and multiple stems, only the effects of overriding and maneuvering are considered by this model. For vehicle performance in vegetation, the peak and average forces developed in overriding a given array of vegetation are determined. These forces are then considered in terms of tractive and impact forces.

14. When the mean spacing of tree stems that must be overridden is less than 1.5 times the vehicle width, the vehicle cannot maneuver to circumvent them. To obtain the maximum stem size to be overridden, a value of 1.5 times the vehicle width is determined, and the stem diameter having that spacing is required to be overridden.

15. The peak impact force (F_h) in pounds is computed by the following equation.

$$F_h = \left(40 - \frac{H_p}{2}\right) d_s^3$$

where

H_p = pushbar or height of leading edge of vehicle, in.

d_s^3 = stem diameter, in.

Peak impact forces are computed for the maximum stem diameters to be overridden. These values are used to determine whether the peak or impact force will exceed the force that the leading edge of the vehicle can withstand or whether the horizontal acceleration will exceed 2 g's, the driver's tolerance limit. If either limit is exceeded, NOGO is predicted.

16. If a vehicle can override the maximum stem diameter to be overridden without exceeding the driver tolerance and leading edge limits, average tractive force (F_o), in pounds, required to override the vegetation is computed by

$$F_o = \frac{56d_s^3}{5.8}$$

17. Off-Road predictions for this study. Off-road vehicle performance in terms of GO/NOGO was predicted for the vehicles considered in this study by determining the tractive force available for a given surface composition factor classes for fine-and coarse-grained soils, and subtracting from the tractive force available the traction force required for the vehicle to negotiate the factor classes of slope, surface geometry, and vegetation. The difference was identified as excess traction. If the excess traction for a given terrain unit was positive, go performance was predicted; and if the excess traction was negative, NOGO performance was predicted.

Net Maximum Drawbar Pull Coefficient at 20 Percent Slip or Maximum Slope Negotiable

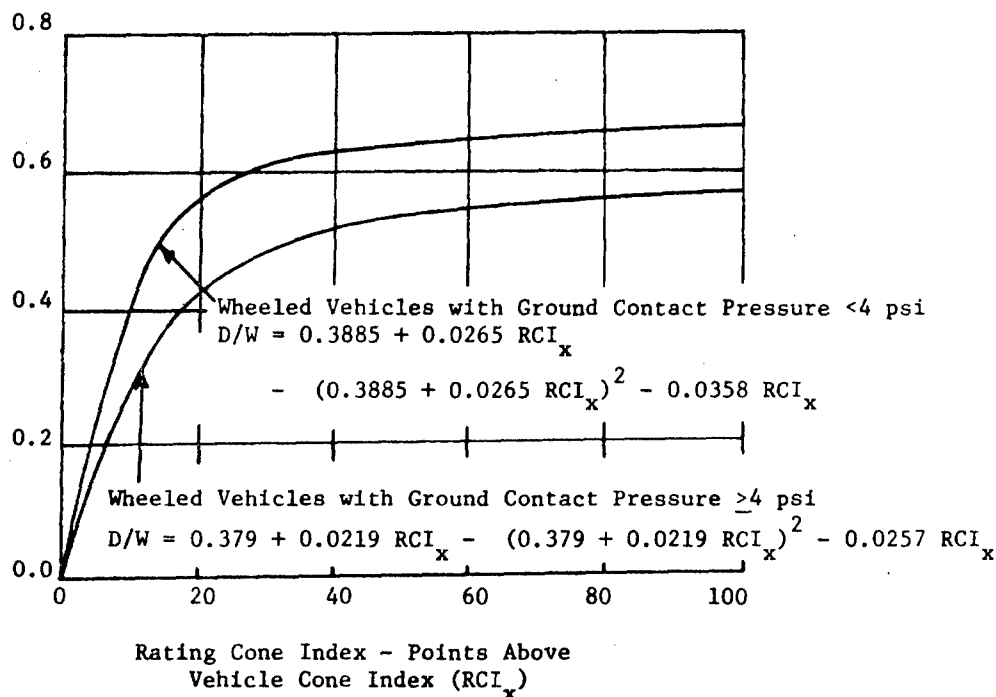
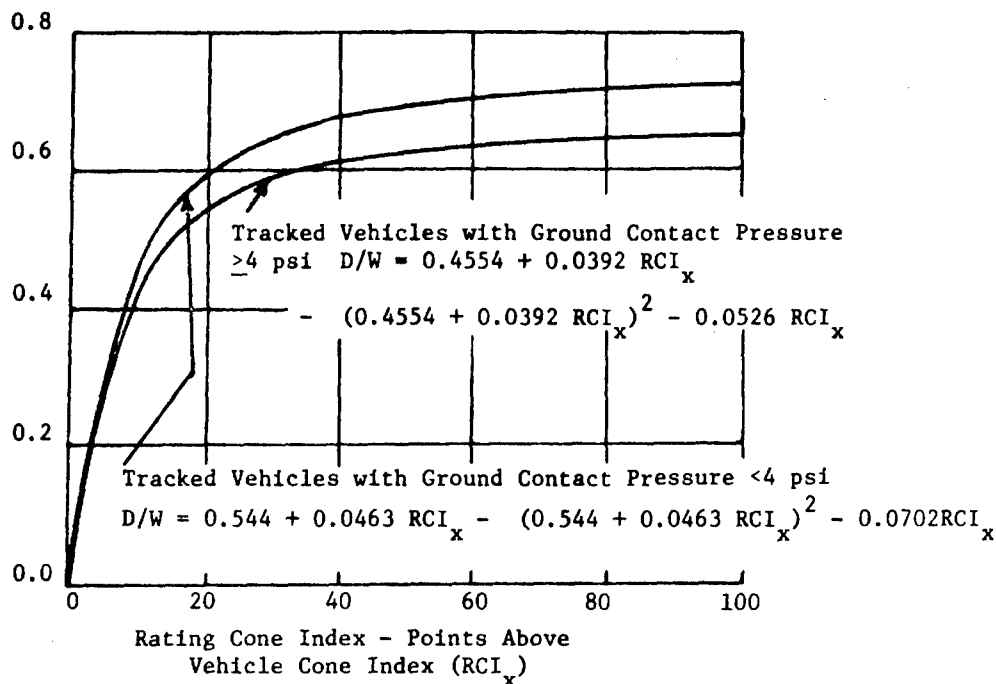


Figure A1. First-pass net maximum drawbar pull, maximum slope negotiable-soil strength relations for tracked and wheeled vehicles operating on fine-grained soils.

A6

Vehicle _____

Basic Equations

$$DP_{\max} \text{ (\% of vehicle wt)} = 28.87(X_1) + 10.10(X_2) - 1.52(X_3) - 0.61(X_4) - (X_5) = \underline{\hspace{2cm}}$$

$$S_{\max} \text{ (\%)} = 28.87(X_1) + 10.10(X_2) - 1.52(X_3) - 0.61(X_4) - (X_6) = \underline{\hspace{2cm}}$$

Vehicle Characteristics and Cone Index

1. Gross wt, lb _____
2. Nominal tire width, in. _____
3. Rim diameter, in. _____
4. No. of powered tires _____
5. Tire ply rating _____
6. Tire inflation pressure, psi _____
7. Cone index of 0- to 6-in. layer _____

X Factors

$$X_1 = \text{strength factor} = \log(7)^* = \underline{\hspace{2cm}}$$

$$X_2 = \text{contact area factor} = \log\left[\frac{(1)}{(X_a)}\right] = \underline{\hspace{2cm}}$$

$$X_a = \text{contact pressure factor} = 0.607 \times (6) + 1.35\left[\frac{117.0 \times (5)}{(X_b)}\right] - 4.93 = \underline{\hspace{2cm}}$$

$$X_b = \text{wheel diameter factor} = 5.0 \times (2) + (3) = \underline{\hspace{2cm}}$$

$$X_3 = \text{same as (4)}$$

$$X_4 = \text{same as (6)}$$

$$X_5 = 43.82 \text{ for maximum net drawbar pull computations}$$

$$X_6 = 45.82 \text{ for maximum slope negotiable}$$

$$DP_{\max} = 28.87(\underline{\hspace{1cm}}) + 10.10(\underline{\hspace{1cm}}) - 1.52(\underline{\hspace{1cm}}) - 0.61(\underline{\hspace{1cm}}) - 43.82$$
$$= \underline{\hspace{2cm}}$$

$$S_{\max} = 28.87(\underline{\hspace{1cm}}) + 10.10(\underline{\hspace{1cm}}) - 1.52(\underline{\hspace{1cm}}) - 0.61(\underline{\hspace{1cm}}) - 45.82$$
$$= \underline{\hspace{2cm}}$$

* Number in parentheses indicates the vehicle characteristic, cone index, or X factor to use.

Figure A2. Data form for computing maximum net drawbar pull (DP_{\max}) and maximum slope negotiable (S_{\max}) for wheeled vehicles in sands

A7

APPENDIX B: DATA USED TO CHARACTERIZE STUDY VEHICLES

1. Extensive data are required to characterize a vehicle to predict its performance with the Army mobility model (AMM). These data for each of the 60 study vehicles are given in Table B1 through B6. All vehicles are described as carrying their rated payloads, with tires at recommended inflations and corresponding deflections. Reduced inflation pressures allowable for operation in sand terrain are also specified.

2. Tractive force-speed relations are from Aberdeen Proving Ground engineering test data for all vehicles except the TDW901, the ASV, and the XM723. For these vehicles, the tractive force-speed was computed from engine and power train data.

3. Both field experience and simulations have shown that dynamic responses of a vehicle crossing minor obstacles have a strong influence on actual vehicle performance. AMM is so structured that values used in it for critical vehicle characteristics may be those determined from dynamics simulation or from experimental data. Since experimental data were available for most of the prime movers in this study, a small dynamics field test program was conducted to determine the effect on dynamic response when a prime mover was towing artillery. In addition, experimental dynamics data were collected on two pieces of self-propelled artillery, since no data on vehicles with similar characteristics were available. The results of the dynamics test program are discussed in Appendix C, and the appropriate data have been incorporated in the tables in this appendix.

Table B1
Values of Vehicle Characteristics

Vehicle Characteristics		M561						M35A2					
No.	Identification	Dimensions	Prime Mover	With M102	With XM204	With XM198	With XM(131mm)	With M102	With XM204	With M114A1	With XM198	With F170	With XM(150mm)
1	Vehicle type (NVL=0 for tracked and 1 for wheeled)	-	1					1					
2	Gross vehicle weight	kips	9.2	12.5	14.0	24.4	25.8	22.6	24.1	32.0	34.6	38.5	35.9
3	Track type (NPL=0 for flexible and 1 for girdertied)	-	NA					NA					
4	Crawler height for tracks; number of tires for wheeled	in.	6	8	8	8	8	12					
5	Tire ply rating	-	4					8					
6	Gross rated horsepower	hp	103					140					
7	Number of tracks or tires	-	6	8	8	8	8	12					
8	Number of axles	-	3	4	4	4	4	4					
9	Vehicle width	in.	84	96	84	110	110	96	96	96	110	102	110
10	Vehicle length	in.	230	492	430	703	703	540.8	478	566	751	620	751
11	Track width or nominal tire width	in.	11					9					
12	Wheel rim diameter	in.	18					20					
13	Recommended tire pressure (cross-country)	psi	22					35					
14	Recommended tire pressure (sand)	psi	12					15					
15	Area of one-track shoe (tracked) or number of wheels (wheeled) (duals as one)	in.	6					8					
16	Number of bogies (tracked) or chain indicator wheeled (0=no chains; 1=chains)	-	0					0					
17	Vehicle ground clearance at the center of greatest wheel span	in.	15.8					19.1					
18	Minimum vehicle ground clearance	in.	14.6	11.2	14.6	13.2	14.0	11.2	12.9	10.0	12.9	12.9	12.9
19	Rear end clearance (vertical clearance of vehicle's trailing edge)	in.	15.8					32.0					
20	Vehicle departure angle	deg	52					40					
21	Vertical clearance of vehicle's leading edge	in.	27					35					
22	Vehicle approach angle	deg	62					40					
23	Length of track on ground or wheel diameter	in.	40					38					
24	Height of vehicle pushbar	in.	27					35					
25	Distance between first and last wheel center lines	in.	165					178					
26	Horizontal distance from the center of gravity to the front wheel center lines	in.	90					88					
27	Vertical distance from the center of gravity to the road wheel center lines	in.	15.0					22.3					
28	Maximum span between adjacent wheel center lines	in.	85					130					
29	Angle between a line parallel to the ground surface and the line connecting the center of gravity and the center of the rear wheel (road wheel or idler). The wheel is the one used to determine departure angle	deg	NA					NA					
30	Distance from the center of gravity to the center of the rear wheel (road wheel or idler). The wheel is the one used to determine approach angle	in.	NA					NA					
31	Vertical distance from the ground to the center of the rear wheel (road wheel or idler)	in.	18.7					17.7					
32	Track thickness plus the radius of the rear wheel (road wheel or idler). The wheel is the one used to determine departure angle. (wheeled=RW) RW = Rolling Radius	in.	18.7					17.7					
33	Loaded rolling radius of tire (cross-country tire pressure) or sprocket pitch radius	in.	18.7					17.7					
34	Height of rigid point used to determine approach angle	in.	24.3					35.0					
35	Maximum braking force the vehicle develops	-	0.8					0.8					
36	Loaded wheel radius (at sand-tire pressure)	in.	18.2					17.4					
37	Total ground-contact area	in.	NA					NA					
38	Distance vehicle spans before significant motion begins	in.	20					19					
39	Maximum force the pushbar can withstand	kips	9.2					19.3					
40	Maximum axle load/gross vehicle weight	-	0.36					0.36					
41	Vehicle rated horsepower per ton	hp/ton	22.5	16.4	14.8	8.4	8.0	12.3	11.6	8.8	8.0	7.3	7.8
42	Transmission type (0=automatic, 1>manual)	-	1					1					
43	Final drive gear ratio	-	5.57					6.27					
44	Final drive gear efficiency	-	0.90					0.90					
45	Number of gears in transmission	-	8					10					
46	Gear ratios for transmission (descending order) See Table B2	-											
47	Transmission efficiency	-	0.90					0.90					
48	Number of point pairs in array TTE	-	30					34					
49	Array containing vehicle speed vs tractive force curve [Speed mph - tractive force (lbs)] See Table B3	-											
50	Number of point pairs in array V008	-	11					19					
51	Array containing vehicle velocity versus obstacle height of 2.5-g vertical acceleration (speed, mph vs obstacle heights, inches) See Table B4	-											
52	Number of points in array VRIDE (cross-country)	-	10					12					
53	Array containing ride dynamics versus speed curve (cross-country) (rms, elevation, vs speed mph) See Table B5	-											
54	Number of points in array VRIDE (road and trails)	-	9					12					
55	Array containing ride dynamics versus speed curve (roads and trails) See Table B6	-											

(Continued)

* NA means not applicable.

NOTE: Values were not repeated for additional towed artillery unless a change occurred.

(Sheet 1 of 6)

B2

Table B1 (Continued)

Vehicle Characteristics			MBT										MGS			
No.	Identification	Dimensions	Prime Mover	With XM204	With M114A1	With XM198	With PH70	With XM(150mm)	With XM204	With M114A1	With XM198	With PH70	With XM(150mm)			
1	Vehicle type (NVR=0 for tracked and 1 for wheeled)			1					1							
2	Gross vehicle weight	kips	32.5	37.3	45.2	47.8	51.8	49.1	30.6	38.5	41.1	45.1	42.4			
3	Track type (NFL=0 for flexible and 1 for girderized)	-	NA						NA							
4	Grouser height for tracks; number of tires for wheeled	in.	10	12	12	12	12	12	10							
5	Tire ply rating	-	12						10							
6	Gross rated horsepower	bhp	265						210							
7	Number of tracks or tires	-	10	12	12	12	12	12	10							
8	Number of axles	-	3	4	4	4	4	4	5							
9	Vehicle width	in.	101	101	101	110	102	110	96	96	110	102	110			
10	Vehicle length	in.	317	517	605	790	659	790	476	564	749	618	749			
11	Track width or nominal tire width	in.	11						16							
12	Wheel rim diameter	in.	20						20							
13	Recommended tire pressure (cross-country)	psi	35						30							
14	Recommended tire pressure (sand)	psi	15						15							
15	Area of one-track shoe (tracked) or number of wheels (wheeled) (duals as one)	in.	6						10							
16	Number of bogies (tracked) or chain indicator wheeled (0=no chains; 1=chains)	-	0						0							
17	Vehicle ground clearance at the center of greatest wheel span	in.	22.5						20.0							
18	Minimum vehicle ground clearance	in.	11.5	11.5	10.0	11.5	11.5	11.5	12.0	10.0	12.0	12.0	12.0			
19	Rear end clearance (vertical clearance of vehicle's trailing edge)	in.	34.6						52.0							
20	Vehicle departure angle	deg	39						62							
21	Vertical clearance of vehicle's leading edge	in.	32						36							
22	Vehicle approach angle	deg	35						50							
23	Length of track on ground or wheel diameter	in.	42						44							
24	Height of vehicle pushbar	in.	32						36							
25	Distance between first and last wheel center lines	in.	206						206							
26	Horizontal distance from the center of gravity to the front wheel center lines	in.	120						110							
27	Vertical distance from the center of gravity to the road wheel center lines	in.	30.6						15.3							
28	Maximum span between adjacent wheel center lines	in.	152						90							
29	Angle between a line parallel to the ground surface and the line connecting the center of gravity and the center of the rear wheel (road wheel or idler). The wheel is the one used to determine departure angle	deg	NA						NA							
30	Distance from the center of gravity to the center of the rear wheel (road wheel or idler). The wheel is the one used to determine approach angle	in.	NA						NA							
31	Vertical distance from the ground to the center of the rear wheel (road wheel or idler)	in.	18.7						20.4							
32	Track thickness plus the radius of the rear wheel (road wheel or idler). The wheel is the one used to determine departure angle. (wheeled=RW)	in.	18.7						20.4							
33	Loaded rolling radius of tire (cross-country tire pressure) or sprocket pitch radius	in.	18.7						20.4							
34	Height of rigid point used to determine approach angle	in.	32.0						32.0							
35	Maximum braking force the vehicle develops	-	0.8						0.8							
36	Loaded wheel radius (at sand-tire pressure)	in.	17.7						19.7							
37	Total ground-contact area	in.	NA						NA							
38	Distance vehicle spans before significant motion begins	in.	21						22							
39	Maximum force the pushbar can withstand	kips	32.5						25.8							
40	Maximum axle load/gross vehicle weight	-	0.35						0.25							
41	Vehicle rated horsepower per ton	hp/ton	16.3	18.7	11.7	11.1	10.2	10.8	13.8	11.0	10.3	9.4	9.9			
42	Transmission type (0=automatic, 1=manual)	-	1						0							
43	Final drive gear ratio	-	6.40						6.40							
44	Final drive gear efficiency	-	0.90						0.90							
45	Number of gears in transmission	-	10						6							
46	Gear ratios for transmission (descending order) See Table B2	-	-						-							
47	Transmission efficiency	-	0.90						0.90							
48	Number of point pairs in array TTE	-	33						24							
49	Array containing vehicle speed vs tractive force curve [Speed mph - tractive force (lbs)] See Table B3	-	-						-							
50	Number of point pairs in array V00B	-	14						15							
51	Array containing vehicle velocity versus obstacle height of 2.5-g vertical acceleration (speed, mph vs obstacle heights, inches) See Table B4	-	-						-							
52	Number of points in array VRIDE (cross-country)	-	24						10							
53	Array containing ride dynamics versus speed curve (cross-country) (rms, elevation, vs speed-mph) See Table B5	-	-						-							
54	Number of points in array VRIDE (road and trails)	-	20						10							
55	Array containing ride dynamics versus speed curve (roads and trails) See Table B6	-	-						-							

(Continued)

* NA means not applicable.

B3

(Sheet 2 of 6)

Table B1 (Continued)

No.	Identification	Dimensions	T10W901					M12Z01				
			With XM204	With M114A1	With XM108	With F117D	With XM113(0mm)	With XM204	With M114A1	With XM108	With F117D	With XM113(0mm)
1	Vehicle type (NVL=0 for tracked and 1 for wheeled)	-	1					1				
2	Gross vehicle weight	kips	43.8	51.7	54.2	58.2	55.6	48.0	55.9	58.5	62.5	59.8
3	Track type (NFL=0 for flexible and 1 for girderized)	-	NA					NA				
4	Crouser height for tracks; number of tires for wheeled	in.	10					6				
5	Tire ply rating	-	12					10				
6	Gross rated horsepower	bhp	225					213				
7	Number of tracks or tires	-	10					6				
8	Number of axles	-	5					3				
9	Vehicle width	in.	96	96	110	102	110	108	108	110	108	110
10	Vehicle length	in.	494	582	767	636	767	575	663	848	717	848
11	Track width or nominal tire width	in.	16					18				
12	Wheel rim diameter	in.	20					33				
13	Recommended tire pressure (cross-country)	psi	14					28				
14	Recommended tire pressure (sand)	psi	7					15				
15	Area of one-track shoe (tracked) or number of wheels (wheeled) (duals as one)	in.	10					6				
16	Number of bogies (tracked) or chain indicator wheeled (0=no chains; 1=chains)	-	0					0				
17	Vehicle ground clearance at the center of greatest wheel span	in.	34.0					29.0				
18	Minimum vehicle ground clearance	in.	15.0	10.0	13.2	15.0	14.0	15.0	10.0	13.2	15.7	14.0
19	Rear end clearance (vertical clearance of vehicle's trailing edge)	in.	32.0					31.0				
20	Vehicle departure angle	deg	65					35				
21	Vertical clearance of vehicle's leading edge	in.	45					48				
22	Vehicle approach angle	deg	55					35				
23	Length of track on ground or wheel diameter	in.	52					69				
24	Height of vehicle pushbar	in.	45					48				
25	Distance between first and last wheel center lines	in.	160					235				
26	Horizontal distance from the center of gravity to the front wheel center lines	in.	108					111				
27	Vertical distance from the center of gravity to the road wheel center lines	in.	32.0					13.1				
28	Maximum span between adjacent wheel center lines	in.	102					235				
29	Angle between a line parallel to the ground surface and the line connecting the center of gravity and the center of the rear wheel (road wheel or idler). The wheel is the one used to determine departure angle	deg	NA					NA				
30	Distance from the center of gravity to the center of the rear wheel (road wheel or idler). The wheel is the one used to determine approach angle	in.	NA					NA				
31	Vertical distance from the ground to the center of the rear wheel (road wheel or idler)	in.	22.5					31.7				
32	Track thickness plus the radius of the rear wheel (road wheel or idler). The wheel is the one used to determine departure angle. (wheeled=RW) RW = Rolling Radius	in.	22.5					31.7				
33	Loaded rolling radius of tire (cross-country tire pressure) or sprocket pitch radius	in.	22.5					31.7				
34	Height of rigid point used to determine approach angle	in.	34.0					48.0				
35	Maximum braking force the vehicle develops	-	0.8					0.8				
36	Loaded wheel radius (at sand-tire pressure)	in.	21.7					29.9				
37	Total ground-contact area	in.	NA					NA				
38	Distance vehicle spans before significant motion begins	in.	26.0					34.5				
39	Maximum force the pushbar can withstand	kips	39.0					43.2				
40	Maximum axle load/gross vehicle weight	-	0.29					0.53				
41	Vehicle rated horsepower per ton	hp/ton	10.3	8.7	8.3	7.7	8.1	8.9	7.6	7.3	6.8	7.1
42	Transmission type (0=automatic, 1>manual)	-	0					0				
43	Final drive gear ratio	-	6.40					14.70				
44	Final drive gear efficiency	-	0.90					0.90				
45	Number of gears in transmission	-	10					6				
46	Gear ratios for transmission (descending order) See Table B2	-										
47	Transmission efficiency	-	0.90					0.90				
48	Number of point pairs in array TTE	-	18					28				
49	Array containing vehicle speed vs tractive force curve [Speed mph - tractive force (lbs)] See Table B3	-										
50	Number of point pairs in array V00B	-	15					11				
51	Array containing vehicle velocity versus obstacle height of 2.5-g vertical acceleration (speed, mph vs obstacle heights, inches) See Table B4	-										
52	Number of points in array VRIDE (cross-country)	-	11					10				
53	Array containing ride dynamics versus speed curve (cross-country) (rms, elevation, vs speed mph) See Table B5	-										
54	Number of points in array VRIDE (road and trails)	-	10					10				
55	Array containing ride dynamics versus speed curve (roads and trails) See Table B6	-										

(Continued)

* NA means not applicable.

(Sheet 3 of 6)

Table B1 (Continued)

Vehicle Characteristics			M125E1			M540E1						
No.	Identification	Dimensions	With M114A1	With XM198	With XM170	Prime Mover	With M102	With XM204	With M114A1	With XM198	With XM170	With XM1130mm
1	Vehicle type (NVEH=0 for tracked and 1 for wheeled)	-	1			0						
2	Gross vehicle weight	kips	64.3	66.9	70.9	26.5	29.8	31.2	39.2	41.7	45.7	43.0
3	Track type (NFL=0 for flexible and 1 for gliderized)	-	NA			0						
4	Grouser height for tracks; number of tires for wheeled	in.	12			1	2	2	2	2	2	2
5	Tire ply rating	-	20			NA						
6	Gross rated horsepower	bhp	300			202						
7	Number of tracks or tires	-	12			2	2	2	2	2	2	2
8	Number of axles	-	4			NA	1	1	1	1	1	1
9	Vehicle width	in.	114	114	114	106	106	106	106	110	106	110
10	Vehicle length	in.	608	793	662	226	489	426	514	700	568	700
11	Track width or nominal tire width	in.	14			15						
12	Wheel rim diameter	in.	24			NA						
13	Recommended tire pressure (cross-country)	psi	40			NA						
14	Recommended tire pressure (sand)	psi	20			NA						
15	Area of one-track shoe (tracked) or number of wheels (wheeled) (duals as one)	sq in.	8			90						
16	Number of bogies (tracked) or chain indicator wheeled (0=no chains; 1=chains)	-	0			10						
17	Vehicle ground clearance at the center of greatest wheel span	in.	26.0			NA						
18	Minimum vehicle ground clearance	in.	10.0	13.2	15.7	16.0	11.2	15.0	10.0	13.2	15.7	14.0
19	Rear end clearance (vertical clearance of vehicle's trailing edge)	in.	28.0			23.0						
20	Vehicle departure angle	deg	45			35						
21	Vertical clearance of vehicle's leading edge	in.	40			50						
22	Vehicle approach angle	deg	30			57						
23	Length of track on ground or wheel diameter	in.	52			120						
24	Height of vehicle pushbar	in.	40			50						
25	Distance between first and last wheel center lines	in.	200			NA						
26	Horizontal distance from the center of gravity to the front wheel center lines	in.	124			94						
27	Vertical distance from the center of gravity to the road wheel center lines	in.	50.0			15.0						
28	Maximum span between adjacent wheel center lines	in.	140			NA						
29	Angle between a line parallel to the ground surface and the line connecting the center of gravity and the center of the rear wheel (road wheel or idler). The wheel is the one used to determine departure angle	deg	NA			13.8						
30	Distance from the center of gravity to the center of the rear wheel (road wheel or idler). The wheel is the one used to determine approach angle	in.	NA			74						
31	Vertical distance from the ground to the center of the rear wheel (road wheel or idler)	in.	21.7			18.0						
32	Track thickness plus the radius of the rear wheel (road wheel or idler). The wheel is the one used to determine departure angle. (wheeled=RW) RW = Rolling Radius	in.	21.7			14.0						
33	Loaded rolling radius of tire (cross-country tire pressure) or sprocket pitch radius	in.	21.7			9.8						
34	Height of rigid point used to determine approach angle	in.	40.0			23.0						
35	Maximum braking force the vehicle develops	-	0.8			0.8						
36	Loaded wheel radius (at sand-tire pressure)	in.	21.7			NA						
37	Total ground-contact area	in.	NA			3600						
38	Distance vehicle spans before significant motion begins	in.	26			60						
39	Maximum force the pushbar can withstand	kips	51.6			52.9						
40	Maximum axle load/gross vehicle weight	-	0.38			NA						
41	Vehicle rated horsepower per ton	hp/ton	9.3	9.0	8.5	15.3	13.6	12.9	10.3	9.7	8.8	9.4
42	Transmission type (0=automatic, 1=manual)	-	1			0						
43	Final drive gear ratio	-	9.02			4.31						
44	Final drive gear efficiency	-	0.95			0.95						
45	Number of gears in transmission	-	6			2						
46	Gear ratios for transmission (descending order) See Table B2	-										
47	Transmission efficiency	-	0.95			0.95						
48	Number of point pairs in array TTE	-	40			26						
49	Array containing vehicle speed vs tractive force curve [Speed mph - tractive force (lbs)] See Table B3	-										
50	Number of point pairs in array V00B	-	20			12						
51	Array containing vehicle velocity versus obstacle height of 2.5-g vertical acceleration (speed, mph vs obstacle heights, inches) See Table B4	-										
52	Number of points in array VRIDE (cross-country)	-	13			12						
53	Array containing ride dynamics versus speed curve (cross-country) (rms, elevation, vs speed mph) See Table B5	-										
54	Number of points in array VRIDE (road and trails)	-	9			11						
55	Array containing ride dynamics versus speed curve (roads and trails) See Table B6	-										

(Continued)

* NA means not applicable.

(Sheet 4 of 6)

Table B1 (continued)

Vehicle Characteristics		M7					ASV Armored					
No.	Identification	Dimensions	Prime Mover	With M14A1	With XM198	With M170	Prime Mover	With XM204	With M14A1	With XM198	With M170	With XM130mm
1	Vehicle type (NVL=0 for tracked and 1 for wheeled)	-	0				0					
2	Gross vehicle weight	kips	37.7	50.4	53.0	57.0	50.7	55.5	63.4	66.0	70.0	67.3
3	Track type (NPL=0 for flexible and 1 for girders)	-	0				0					
4	Grouser height for tracks; number of tires for wheeled	in.	2.0	2	2	2	1.0	2	2	2	2	2
5	Tire ply rating	-	NA				NA					
6	Gross rated horsepower	hhp	285				450					
7	Number of tracks or tires	-	2	2	2	2	2	2	2	2	2	2
8	Number of axles	-	NA	1	1	1	NA	1	1	1	1	1
9	Vehicle width	in.	110	110	110	110	117	117	117	117	117	117
10	Vehicle length	in.	235	523	708	577	265	465	553	738	607	738
11	Track width or nominal tire width	in.	18				21					
12	Wheel rim diameter	in.	NA				NA					
13	Recommended tire pressure (cross-country)	psi	NA				NA					
14	Recommended tire pressure (sand)	psi	NA				NA					
15	Area of one-track shoe (tracked) or number of wheels (wheeled) (duals as one)	in.	108				126					
16	Number of bogies (tracked) or chain indicator wheeled (0=no chains; 1=chains)	-	8									
17	Vehicle ground clearance at the center of greatest wheel span	in.	NA				12					
18	Minimum vehicle ground clearance	in.	18.0	10.0	13.2	15.7	NA					
19	Rear end clearance (vertical clearance of vehicle's trailing edge)	in.	35.0				14.0	14.0	10.0	13.2	14.0	14.0
20	Vehicle departure angle	deg	34				27.0					
21	Vertical clearance of vehicle's loading edge	in.	60				45					
22	Vehicle approach angle	deg	34				43					
23	Length of track on ground or wheel diameter	in.	107				67					
24	Height of vehicle pushbar	in.	60				165					
25	Distance between first and last wheel center lines	in.	NA				43					
26	Horizontal distance from the center of gravity to the front wheel center lines	in.	61				NA					
27	Vertical distance from the center of gravity to the road wheel center lines	in.	18.0				76					
28	Maximum span between adjacent wheel center lines	in.	NA				38.4					
29	Angle between a line parallel to the ground surface and the line connecting the center of gravity and the center of the rear wheel (road wheel or idler). The wheel is the one used to determine departure angle	deg	10.0				NA					
30	Distance from the center of gravity to the center of the rear wheel (road wheel or idler). The wheel is the one used to determine approach angle	in.	70				8.5					
31	Vertical distance from the ground to the center of the rear wheel (road wheel or idler)	in.	28.0				114					
32	Track thickness plus the radius of the rear wheel (road wheel or idler). The wheel is the one used to determine departure angle. (wheeled-RW) RW = Rolling Radius	in.	18.0				27.3					
33	Loaded rolling radius of tire (cross-country tire pressure) or sprocket pitch radius	in.	12.4				15.0					
34	Height of rigid point used to determine approach angle	in.	60.0				10.8					
35	Maximum braking force the vehicle develops	-	0.8				42.7					
36	Loaded wheel radius (at sand-tire pressure)	in.	NA				0.8					
37	Total ground-contact area	in.	3852				NA					
38	Distance vehicle spans before significant motion begins	in.	48				6930					
39	Maximum force the pushbar can withstand	kips	80.0				81					
40	Maximum axle load/gross vehicle weight	-	NA				101.5					
41	Vehicle rated horsepower per ton	hp/ton	15.1	11.3	10.8	10.0	NA					
42	Transmission type (0=automatic, 1=manual)	-	0				17.7	16.2	14.2	13.6	12.9	13.4
43	Final drive gear ratio	-	8.83				0					
44	Final drive gear efficiency	-	0.90				4.40					
45	Number of gears in transmission	-	6				0.97					
46	Gear ratios for transmission (descending order) See Table B2	-					3					
47	Transmission efficiency	-	0.90				0.95					
48	Number of point pairs in array TTE	-	37				35					
49	Array containing vehicle speed vs tractive force curve [Speed mph - tractive force (lbs)] See Table B3	-										
50	Number of point pairs in array V008	-	12				9					
51	Array containing vehicle velocity versus obstacle height of 2.5-g vertical acceleration (speed, mph vs obstacle heights, inches) See Table B4	-										
52	Number of points in array VRIDE (cross-country)	-	11				11					
53	Array containing ride dynamics versus speed curve (cross-country) (rms, elevation, vs speed mph) See Table B5	-										
54	Number of points in array VRIDE (road and trails)	-	11				8					
55	Array containing ride dynamics versus speed curve (roads and trails) See Table B6	-										

(Continued)

* NA means not applicable.

(Sheet 5 of 6)

Table #1 (Concluded)

Vehicle Characteristics		Dimensions	M109A1	M107	M110E2	M113A1	M60A2	M577A1	XM723	XM1
No.	Identification									
1	Vehicle type (NVEH=0 for tracked and 1 for wheeled)	-	0	0	0	0	0	0	0	0
2	Gross vehicle weight	kips	53.1	62.1	62.1	23.4	104.0	24.4	40.4	115.4
3	Track type (NFL=0 for flexible and 1 for girderized)	-	0	0	0	0	0	0	0	0
4	Crouser height for tracks; number of tires for wheeled	in.	1.0	1.0	1.0	1.0	1.5	1.0	0.7	1.2
5	Tire ply rating	-	NA	NA	NA	NA	NA	NA	NA	NA
6	Gross rated horsepower	bhp	405	405	405	209	750	210	450	1500
7	Number of tracks or tires	-	2	2	2	2	2	2	2	2
8	Number of axles	-	NA	NA	NA	NA	NA	NA	NA	NA
9	Vehicle width	in.	124	124	124	106	143	105	126	145
10	Vehicle length	in.	240	250	264	192	273	191	245	290
11	Track width or nominal tire width	in.	15	18	18	15	28	15	21	24
12	Wheel rim diameter	in.	NA	NA	NA	NA	NA	NA	NA	NA
13	Recommended tire pressure (cross-country)	psi	NA	NA	NA	NA	NA	NA	NA	NA
14	Recommended tire pressure (sand)	psi	NA	NA	NA	NA	NA	NA	NA	NA
15	Area of one-track shoe (tracked) or number of wheels (wheeled) (duals as one)	in.	90	108	108	90	194	90	126	168
16	Number of bogies (tracked) or chain indicator wheeled (0=no chains; 1=chains)	-	14	10	10	10	12	10	12	12
17	Vehicle ground clearance at the center of greatest wheel span	in.	NA	NA	NA	NA	NA	NA	NA	NA
18	Minimum vehicle ground clearance	in.	17.7	14.8	18.4	16.0	18.0	16.0	18.0	19.0
19	Rear end clearance (vertical clearance of vehicle's trailing edge)	in.	31.0	60.0	60.0	24.5	40.0	24.5	31.0	30.0
20	Vehicle departure angle	deg	80	44	44	40	42	40	78	68
21	Vertical clearance of vehicle's leading edge	in.	45	43	39	30	45	30	42	40
22	Vehicle approach angle	deg	75	90	90	70	90	70	83	77
23	Length of track on ground or wheel diameter	in.	160	152	152	109	171	108	153	191
24	Height of vehicle pushbar	in.	45	43	39	30	45	30	42	40
25	Distance between first and last wheel center lines	in.	NA	NA	NA	NA	NA	NA	NA	NA
26	Horizontal distance from the center of gravity to the front wheel center lines	in.	94	99	92	52	77	54	72	85
27	Vertical distance from the center of gravity to the road wheel center lines	in.	31.9	30.3	28.7	24.0	36.0	30.5	28.8	50.4
28	Maximum span between adjacent wheel center lines	in.	NA	NA	NA	NA	NA	NA	NA	NA
29	Angle between a line parallel to the ground surface and the line connecting the center of gravity and the center of the rear wheel (road wheel or idler). The wheel is the one used to determine departure angle	deg	11.6	23.6	21.7	17.4	6.5	18.5	9.0	12.0
30	Distance from the center of gravity to the center of the rear wheel (road wheel or idler). The wheel is the one used to determine approach angle	in.	117	85	92	78	124	79	106	127
31	Vertical distance from the ground to the center of the rear wheel (road wheel or idler)	in.	21.5	19.0	19.0	20.0	42.0	20.0	28.0	40.0
32	Track thickness plus the radius of the rear wheel (road wheel or idler). The wheel is the one used to determine departure angle. (wheeled=RW)	in.	15.0	19.0	19.0	14.5	18.0	14.5	14.8	18.5
33	Loaded rolling radius of tire (cross-country tire pressure) or sprocket pitch radius	in.	9.8	10.6	10.6	9.8	12.2	9.8	10.5	10.0
34	Height of rigid point used to determine approach angle	in.	45.0	43.0	39.0	28.2	45.0	28.0	42.0	19.0
35	Maximum braking force the vehicle develops	-	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.5
36	Loaded wheel radius (at sand-tire pressure)	in.	NA	NA	NA	NA	NA	NA	NA	NA
37	Total ground-contact area	in.	4800	5472	5472	3270	9576	3240	6426	9168
38	Distance vehicle spans before significant motion begins	in.	68	72	69	50	67	66	76	94
39	Maximum force the pushbar can withstand	kips	106.1	124.2	124.2	55.0	185.0	48.5	100.0	230.8
40	Maximum axle load/gross vehicle weight	-	NA	NA	NA	NA	NA	NA	NA	NA
41	Vehicle rated horsepower per ton	hp/ton	15.7	13.0	13.7	17.9	15.0	17.9	22.3	26.0
42	Transmission type (0=automatic, 1=manual)	-	0	0	0	0	0	0	0	0
43	Final drive gear ratio	-	4.36	5.35	5.35	3.93	5.08	3.93	4.40	3.91
44	Final drive gear efficiency	-	0.90	0.95	0.90	0.95	0.90	0.95	0.95	0.95
45	Number of gears in transmission	-	4	4	4	3	2	3	3	5
46	Gear ratios for transmission (descending order) See Table B2	-	-	-	-	-	-	-	-	-
47	Transmission efficiency	-	0.90	0.95	0.90	0.95	0.90	0.95	0.86	0.98
48	Number of point pairs in array TTE	-	23	23	23	30	16	30	35	12
49	Array containing vehicle speed vs tractive force curve [Speed mph - tractive force (lbs)] See Table B3	-	-	-	-	-	-	-	-	-
50	Number of point pairs in array V00B	-	16	16	16	19	10	19	9	22
51	Array containing vehicle velocity versus obstacle height of 2.5-g vertical acceleration (speed, mph vs obstacle heights, inches) See Table B4	-	-	-	-	-	-	-	-	-
52	Number of points in array VRIDE (cross-country)	-	19	19	19	22	12	22	22	15
53	Array containing ride dynamics versus speed curve (cross-country) (rms, elevation, vs speed mph) See Table B5	-	-	-	-	-	-	-	-	-
54	Number of points in array VRIDE (road and trails)	-	11	11	11	21	12	21	18	15
55	Array containing ride dynamics versus speed curve (roads and trails) See Table B6	-	-	-	-	-	-	-	-	-

(Continued)

* NA means not applicable.

(Sheet 6 of 6)

BF

Table B2

Gear Ratios for Study Vehicles

VEHICLE CHARACTERISTIC No. 46 in Table B1

Vehicle	Gear Ratios for Transmission										
	12.64	7.06	6.41	3.58	3.06	1.79	1.71	1.00	1.00	1.00	0.79
M561	12.64	7.06	6.41	3.58	3.06	1.79	1.71	1.00	1.00	1.00	0.79
M35A2	9.94	5.50	5.02	3.21	2.78	1.98	1.62	1.56	1.00	1.00	0.79
M813	12.29	6.88	6.07	3.62	3.40	2.02	1.79	1.58	1.00	1.00	0.78
M656	5.49	3.95	2.79	2.01	1.44	1.04					
TDW901	11.18	8.04	4.98	3.58	2.91	2.09	1.93	1.39	1.39	1.00	1.00
M520E1	5.22	3.01	2.30	1.73	1.33	1.00					
M125E1	4.00	2.28	2.00	1.41	1.00	0.71					
M548E1	3.81	1.94	1.00								
UET	4.00	2.82	2.00	1.91	1.00						
ASV-ARMORED	-	-	-								
M109A1	4.69	3.18	1.59	0.79							
M107	4.69	3.18	1.59	0.79							
M110E2	4.69	3.18	1.59	0.79							
M113A1	3.81	1.94	1.00								
M60A2	3.50	1.26									
M577A1	3.81	1.94	1.00								
XM723	-	-	-								
XM1	-	-	-								

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Table B3

Tractive Force-Speed Relations for Vehicle Characteristic No. 49 in Table B1

M561			M35A2			M813			M656			TDW901			M520E1		
Vehicle Speed mph	Tractive Force lb		Vehicle Speed mph	Tractive Force lb		Vehicle Speed mph	Tractive Force lb		Vehicle Speed mph	Tractive Force lb		Vehicle Speed mph	Tractive Force lb		Vehicle Speed mph	Tractive Force lb	
0.0	8,520		0.0	14,013		0.0	25,540		0.0	21,600		0.0	25,000		0.0	38,500	
3.4	8,510		2.2	13,899		2.0	25,440		1.0	20,460		1.5	21,000		0.4	36,500	
4.0	8,160		3.2	12,991		2.4	25,190		2.6	16,460		2.5	17,300		0.9	32,500	
4.4	7,660		4.3	11,174		2.6	24,440		4.0	13,500		4.0	12,000		1.2	28,500	
4.5	6,940		4.4	7,824		3.1	21,440		6.2	9,710		5.0	10,400		1.6	24,500	
4.6	4,770		5.4	7,484		3.2	14,590		6.3	8,000		7.5	7,000		2.1	20,500	
5.2	4,760		6.6	6,973		4.0	14,540		7.2	7,920		10.0	5,000		2.9	16,500	
6.3	4,565		8.0	6,325		4.9	13,540		7.6	7,420		12.5	4,000		3.9	12,500	
7.0	4,375		8.1	6,098		5.5	12,750		7.7	6,820		15.0	3,300		4.7	9,700	
7.3	4,030		8.6	5,769		5.6	11,750		10.0	5,840		20.0	2,250		5.6	8,570	
7.8	3,660		8.7	4,633		6.3	10,860		12.2	5,050		25.0	2,000		7.4	6,830	
8.3	3,085		10.6	4,486		6.4	7,860		12.3	4,150		30.0	1,750		8.4	5,940	
8.4	2,500		12.2	4,168		7.6	7,500		13.8	3,860		35.0	1,600		10.0	5,750	
11.7	2,490		13.8	3,736		9.0	7,500		16.0	3,260		40.0	1,250		11.1	5,550	
12.8	2,470		13.9	3,566		11.0	6,730		16.1	3,260		45.0	1,200		12.1	5,060	
14.2	2,315		15.9	3,248		11.1	6,630		20.0	3,180		50.0	1,000		12.6	4,370	
15.0	2,130		16.0	2,850		11.6	6,340		22.0	2,990		55.0	--		14.0	4,280	
16.0	2,035		18.4	2,714		11.7	4,690		24.0	2,600					15.0	4,100	
16.9	1,930		21.1	2,521		13.7	4,670		27.9	2,280					16.0	3,810	
17.8	1,730		23.1	2,351		16.0	4,570		33.0	1,850					16.9	3,220	
17.9	1,270		23.2	2,181		19.7	4,060		33.1	1,700					18.6	3,140	
24.4	1,265		25.0	2,124		19.8	3,960		38.7	1,650					20.0	2,850	
27.5	1,170		28.2	1,840		22.5	3,600		50.0	1,200					21.7	2,560	
30.0	1,095		28.3	1,783		22.6	3,500			--					24.0	2,480	
31.4	1,010		29.1	1,726		25.4	3,220								26.0	2,300	
31.5	740		29.2	1,385		25.5	2,420								28.0	1,940	
42.0	730		36.0	1,374		28.6	2,410								30.0	1,600	
47.0	685		42.0	1,272		35.4	2,210									--	
55.0	640		45.0	1,102		40.3	2,010										
	--		45.1	1,090		40.4	1,860										
			51.0	1,034		45.4	1,730										
			53.0	1,011		50.0	1,610										
			58.0	919		50.0	--										
			58.0	--													

(Continued)

(Sheet 1 of 3)

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Table B3 (Continued)

M125E1			MS48E1			UET			ASV-ARMORED			M109A1			M107		
Vehicle Speed mph	Tractive Force lb		Vehicle Speed mph	Tractive Force lb		Vehicle Speed mph	Tractive Force lb		Vehicle Speed mph	Tractive Force lb		Vehicle Speed mph	Tractive Force lb		Vehicle Speed mph	Tractive Force lb	
0.0	32,545		0.0	19,750		0.0	47,328		0.0	49,801		0.0	41,104		0.0	46,440	
1.9	32,345		0.8	19,650		0.5	41,961		0.1	49,801		0.8	41,015		0.8	46,340	
2.2	31,945		1.5	17,050		1.0	35,624		0.3	43,350		1.3	37,033		1.3	41,840	
2.4	30,545		2.6	13,050		1.5	29,367		0.5	42,689		2.2	28,182		2.2	31,840	
2.8	28,045		3.3	11,050		2.0	22,872		0.7	39,842		3.2	20,782		3.2	23,480	
3.2	25,545		4.2	9,050		2.5	21,471		0.9	38,308		3.7	20,711		3.7	23,400	
3.3	24,245		5.5	6,580		3.0	20,096		1.2	36,001		4.3	19,932		4.3	22,520	
3.4	19,045		6.4	6,565		3.5	17,492		1.5	32,260		5.5	15,015		5.5	16,965	
3.6	18,945		7.2	6,470		4.0	15,513		2.1	27,889		5.6	14,312		5.6	16,170	
4.0	18,545		8.0	6,080		4.5	15,658		2.8	23,704		6.4	13,356		6.4	15,090	
4.3	18,045		9.4	5,190		5.0	15,373		3.2	22,133		7.4	11,532		7.4	13,030	
5.0	16,445		10.0	4,700		5.5	14,554		3.7	20,074		8.2	10,312		8.2	11,650	
5.6	14,755		10.1	3,800		6.0	10,550		4.3	17,929		8.3	8,634		8.3	9,755	
5.7	11,860		13.3	3,775		6.5	11,188		5.2	15,172		10.3	6,780		10.3	7,660	
6.0	11,655		14.8	3,740		7.0	10,899		6.3	12,712		12.0	6,718		12.0	7,590	
6.6	11,575		16.0	3,650		7.5	10,515		6.5	10,261		14.1	6,293		14.1	7,110	
7.4	11,085		18.0	3,270		8.0	10,070		7.4	9,669		16.0	5,155		16.0	5,825	
8.1	10,595		19.3	3,030		8.5	7,508		8.6	8,723		16.1	4,452		16.1	5,030	
8.9	9,605		21.8	2,605		9.0	7,828		9.9	7,968		20.2	3,363		20.2	3,800	
9.5	9,115		24.0	2,310		10.0	7,686		11.4	7,295		24.0	3,355		24.0	3,790	
10.0	8,625		26.0	2,160		11.0	7,277		14.2	6,177		28.2	3,142		28.2	3,550	
10.1	7,625		28.0	2,110		11.5	7,036		17.0	5,313		32.0	2,576		32.0	2,910	
10.6	7,535		32.0	2,010		12.0	6,738		21.3	4,314		--	--		--	--	
11.6	7,355		36.0	1,985		12.5	4,907		23.3	3,960							
13.0	6,985		40.0	1,960		13.5	4,539		25.6	3,597							
14.2	6,510		--	--		14.5	4,220		27.5	3,306							
15.0	6,230					15.5	3,995		29.8	2,986							
16.6	5,360					17.5	3,834		31.4	2,928							
16.7	4,360					20.5	3,794		34.1	2,780							
18.0	4,290					22.0	3,639		35.5	2,694							
20.0	4,030					23.0	3,518		36.9	2,589							
22.7	3,580					23.5	2,641		38.3	2,484							
25.6	3,095					25.0	2,751		41.2	2,255							
27.3	2,095					28.0	2,736		43.7	2,025							
27.4	2,425					31.0	2,582		43.7	--							
30.0	2,420					32.5	2,492		--	--							
34.0	2,415					--	--										
38.0	2,410																
41.2	2,380																
41.2	--																

(Continued)

(Sheet 2 of 3)

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Table B3 (Concluded)

M110E2			M113A1			M60A2			M577A1			XM723			XM1		
Vehicle Speed mph	Tractive Force lb		Vehicle Speed mph	Tractive Force lb		Vehicle Speed mph	Tractive Force lb		Vehicle Speed mph	Tractive Force lb		Vehicle Speed mph	Tractive Force lb		Vehicle Speed mph	Tractive Force lb	
0.0	46,440		0.0	17,950		0.0	72,790		0.0	17,950		0.0	49,801		0.0	103,968	
0.8	46,340		1.0	16,330		1.4	62,800		1.0	16,330		0.1	49,801		4.0	75,240	
1.3	41,840		1.5	15,850		2.3	52,850		1.5	15,850		0.3	43,350		8.0	51,984	
2.2	31,840		1.9	15,800		3.5	42,910		1.9	15,800		0.5	42,689		12.0	30,436	
3.2	23,480		1.9	14,250		4.5	38,000		1.9	14,250		0.7	39,842		16.0	25,650	
3.7	23,400		2.0	12,750		5.5	33,020		2.0	12,750		0.9	38,308		20.0	17,784	
4.3	22,520		2.5	11,250		6.8	28,100		2.5	11,250		1.2	36,001		24.0	17,100	
5.5	16,965		3.2	9,750		8.0	23,200		3.2	9,750		1.5	32,260		28.0	15,048	
5.6	16,170		3.9	8,770		12.0	14,600		3.9	8,770		2.1	27,889		32.0	13,680	
6.4	15,090		4.8	8,030		16.0	10,800		4.8	8,030		2.8	23,704		40.0	10,944	
7.4	13,030		5.8	7,380		20.0	9,100		5.8	7,380		3.2	22,133		48.0	9,576	
8.2	11,650		5.9	6,990		24.0	7,100		5.9	6,990		3.7	20,074				
8.3	9,755		7.5	6,975		26.0	6,700		7.5	6,975		4.3	17,929				
10.3	7,660		8.0	6,650		28.0	6,000		8.0	6,650		5.2	15,172				
12.0	7,590		9.5	6,050		30.0	3,000		9.5	6,050		6.3	12,712				
14.1	7,110		10.8	5,300		30.0	--		10.8	5,300		6.5	10,261				
16.0	5,825		10.9	4,100					10.9	4,100		7.3	9,669				
16.1	5,030		12.0	3,700					12.0	3,700		8.6	8,723				
20.2	3,800		13.1	3,500					13.1	3,500		9.9	7,968				
24.0	3,790		15.0	3,450					15.0	3,450		11.4	7,295				
28.2	3,550		17.1	3,300					17.1	3,300		14.2	6,177				
32.0	2,910		19.2	3,000					19.2	3,000		17.0	5,313				
	--		21.3	2,500					21.3	2,500		21.3	4,314				
			21.4	1,850					21.4	1,850		23.3	3,960				
			25.3	1,815					25.3	1,815		25.6	3,597				
			29.0	1,785					29.0	1,785		27.5	3,306				
			33.0	1,710					33.0	1,710		29.8	2,986				
			37.1	1,550					37.1	1,550		31.4	2,928				
			42.0	1,300					42.0	1,300		34.1	2,780				
			42.0	--					42.0	--		35.5	2,694				
												36.9	2,589				
												38.3	2,484				
												41.2	2,255				
												43.7	2,025				
												43.7	--				

B11

Table B4
Obstacle Height-Speed Relations for Vehicle Characteristic No. 51 in Table B1

M561			M35A2			M813			M656			TDW901			M520E1		
Obstacle Height in.	Vehicle Speed mph		Obstacle Height in.	Vehicle Speed mph		Obstacle Height in.	Vehicle Speed mph		Obstacle Height in.	Vehicle Speed mph		Obstacle Height in.	Vehicle Speed mph		Obstacle Height in.	Vehicle Speed mph	
0.0	100.0		0.0	100.0		0.0	100.0		0.0	50.0		0.0	55.0		0.0	100.0	
4.5	100.0		3.7	100.0		4.5	100.0		0.1	50.0		0.1	55.0		5.5	100.0	
4.5	40.0		4.2	80.0		5.0	80.0		4.4	50.0		5.9	55.0		5.5	60.0	
5.0	30.0		4.8	56.0		5.5	60.0		4.6	40.0		6.0	48.0		6.0	34.0	
6.0	18.0		5.0	52.0		6.0	40.0		5.0	33.0		6.4	40.0		6.5	20.0	
8.0	10.0		5.8	40.0		7.0	22.0		5.6	26.0		7.0	33.0		7.0	16.0	
10.0	8.0		6.7	30.0		8.0	16.0		6.0	22.3		7.4	30.0		8.0	8.0	
15.0	5.0		8.4	20.0		9.0	10.0		7.0	17.2		8.0	26.0		10.0	4.0	
20.0	4.0		10.0	13.0		10.0	7.0		8.0	14.0		9.0	22.0		15.0	2.0	
30.0	3.0		11.5	10.0		12.5	4.0		10.0	9.7		10.0	18.2		25.0	2.0	
50.0	3.0		15.0	6.0		15.0	2.8		12.0	7.2		12.0	13.0		50.0	1.0	
			20.0	3.2		20.0	2.0		14.0	5.7		14.0	9.8				
			25.0	2.0		25.0	1.0		16.0	4.7		16.0	8.7				
			50.0	0.6		50.0	1.0		18.0	3.8		18.0	8.0				
									50.0	0.6		50.0	0.6				

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(Continued)

(Sheet 1 of 3)

Table B4 (Continued)

M125E1			M548E1			UET			ASV-ARMORED			M109A1			M107		
Obstacle Height in.	Vehicle Speed mph		Obstacle Height in.	Vehicle Speed mph		Obstacle Height in.	Vehicle Speed mph		Obstacle Height in.	Vehicle Speed mph		Obstacle Height in.	Vehicle Speed mph		Obstacle Height in.	Vehicle Speed mph	
0.0	100.0		0.0	100.0		0.0	100.0		0.0	100.0		0.0	100.0		0.0	100.0	
4.1	100.0		5.5	100.0		12.8	30.0		7.4	48.0		4.1	100.0		4.1	100.0	
5.0	86.0		5.8	60.0		13.0	25.0		7.8	40.0		4.1	35.0		4.1	35.0	
5.2	70.0		6.0	40.0		13.6	20.0		8.4	30.0		4.2	30.0		4.2	30.0	
5.4	60.0		6.5	20.0		14.9	15.0		9.2	20.0		4.3	27.5		4.3	27.5	
5.7	50.0		7.5	11.0		16.0	11.8		10.0	13.5		4.6	24.5		4.6	24.5	
6.0	40.0		8.0	9.0		17.0	10.0		12.0	10.0		4.9	21.5		4.9	21.5	
6.5	30.0		9.0	8.5		17.7	9.6		20.0	8.0		5.3	19.5		5.3	19.5	
7.5	20.0		10.0	7.0		20.0	9.0		50.0	2.0		5.7	18.0		5.7	18.0	
8.0	15.0		20.0	5.0		25.0	8.0					6.0	17.0		6.0	17.0	
9.0	10.0		30.0	4.0		30.0	7.3					7.0	15.5		7.0	15.5	
10.0	7.0		50.0	3.0		50.0	5.9					8.2	14.0		8.2	14.0	
11.0	6.0											9.4	13.0		9.4	13.0	
13.0	5.0											10.2	12.5		10.2	12.5	
15.0	4.0											12.0	11.0		12.0	11.0	
20.0	3.0											50.0	0.0		50.0	0.0	
25.0	2.0																
30.0	1.5																
35.0	1.0																
50.0	0.6																

B13

(Continued)

(Sheet 2 of 3)

Table 34 (Concluded)

M110E2			M113A1			M60A2			M577A1			XM723			XM1		
Obstacle Height in.	Vehicle Speed mph		Obstacle Height in.	Vehicle Speed mph		Obstacle Height in.	Vehicle Speed mph		Obstacle Height in.	Vehicle Speed mph		Obstacle Height in.	Vehicle Speed mph		Obstacle Height in.	Vehicle Speed mph	
0.0	100.0		0.0	100.0		0.0	60.0		0.0	100.0		0.0	100.0		0.0	100.0	
4.1	100.0		5.1	100.0		9.0	60.0		5.1	100.0		7.4	48.0		12.6	100.0	
4.1	35.0		5.3	80.0		9.3	30.0		5.3	80.0		7.8	40.0		12.6	50.0	
4.2	30.0		5.5	60.0		9.8	16.0		5.5	60.0		8.4	30.0		12.6	40.0	
4.3	27.5		6.0	40.0		10.0	12.5		6.0	40.0		9.2	20.0		12.6	30.0	
4.6	24.5		6.4	31.5		11.0	7.0		6.4	31.5		10.9	13.5		12.8	25.0	
4.9	21.5		6.7	26.8		12.0	5.9		6.7	26.8		12.0	10.0		13.0	24.0	
5.3	19.5		7.1	20.0		13.5	5.0		7.1	20.0		20.0	8.0		13.3	21.0	
5.7	18.0		8.0	15.0		15.0	2.5		8.0	15.0		50.0	2.0		13.5	19.0	
6.0	17.0		10.0	10.0		50.0	2.5		10.0	10.0					14.0	16.0	
7.0	15.5		11.0	8.3					11.0	8.3					15.0	13.0	
8.2	14.0		12.4	6.8					12.4	6.8					16.0	11.0	
9.4	13.0		13.7	5.5					13.7	5.5					17.0	10.0	
10.2	12.5		15.0	4.8					15.0	4.8					18.0	9.0	
12.0	11.0		18.0	3.0					18.0	3.0					19.0	8.9	
50.0	0.0		20.0	2.8					20.0	2.8					20.0	8.5	
			30.0	2.0					30.0	2.0					22.5	8.0	
			40.0	1.2					40.0	1.2					25.0	7.8	
			50.0	1.2					50.0	1.2					30.0	7.3	
															35.0	7.0	
															40.0	7.0	
															50.0	7.0	

B14

Table B5

Cross-Country Ride Versus Speed Relations for Vehicle Characteristic No. 53 in Table B1

M561			M35A2			M813			M656			TDW901			M520E1			M125E1		
Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	
0	100.0	0	100.0	0	100.0	0	100.0	0	100.0	0	100.0	0	100.0	0	100.0	0	100.0	0	100.0	
0.15	60.0	0.23	80.0	0.20	100.0	0.24	80.0	0.24	80.0	0.24	80.0	0.10	100.0	0.18	100.0	0.18	100.0	0.18	100.0	
0.17	40.0	0.24	60.0	0.20	60.0	0.25	50.0	0.25	54.0	0.25	54.0	0.20	40.0	0.20	40.0	0.20	60.0	0.20	60.0	
0.25	30.0	0.25	40.0	0.23	50.0	0.34	30.0	0.30	40.0	0.30	40.0	0.30	24.0	0.30	24.0	0.30	38.0	0.30	38.0	
0.50	20.0	0.35	30.0	0.25	40.0	0.50	22.5	0.50	29.2	0.50	29.2	0.35	20.0	0.40	20.0	0.40	31.0	0.40	31.0	
1.00	15.5	0.46	25.0	0.28	35.0	0.75	19.6	0.75	24.1	0.75	24.1	0.50	14.0	0.60	14.0	0.60	24.0	0.60	24.0	
1.50	13.0	0.72	20.0	0.31	30.0	1.00	17.3	1.00	20.7	1.00	20.7	0.80	10.0	0.80	10.0	0.80	20.0	0.80	20.0	
2.00	11.5	1.00	16.6	0.34	28.0	2.00	10.0	2.00	15.5	1.50	15.5	1.20	8.0	1.05	8.0	1.05	16.0	1.05	16.0	
3.00	7.5	1.17	15.0	0.38	25.0	3.00	10.0	3.00	12.0	2.00	12.0	2.00	6.0	1.20	6.0	1.20	14.0	1.20	14.0	
8.00	6.5	2.00	10.0	0.47	22.0	8.00	10.0	8.00	12.0	3.00	12.0	8.00	5.5	1.70	5.5	1.70	10.0	1.70	10.0	
		3.00	8.0	0.50	21.0									2.20		2.20	8.0	2.20	8.0	
		8.00	6.0	0.55	20.0									3.00		3.00	7.0	3.00	7.0	
				0.75	17.0									8.00		8.00	6.0	8.00	6.0	
				0.85	16.0															
				1.00	14.0															
				1.25	12.0															
				1.50	10.0															
				1.75	9.0															
				2.00	8.0															
				2.25	7.0															
				2.50	6.5															
				3.00	5.0															
				4.00	5.0															
				8.00	5.0															

B15

(Continued)

(Sheet 1 of 3)

B15

Table B5 (Continued)

M1040C1			UET			ASV-Armored			M109A1			M107			M110E2		
Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph
0	100.0	0	100.0	0	100.0	0	100.0	0	80.0	0	80.0	0	80.0	0	80.0	0	80.0
0.34	80.0	1.07	30.0	0.54	100.0	0.33	60.0	0.33	60.0	0.33	60.0	0.33	60.0	0.33	60.0	0.33	60.0
0.35	60.0	1.13	25.0	0.54	60.0	0.50	51.0	0.50	51.0	0.50	51.0	0.50	51.0	0.50	51.0	0.50	51.0
0.36	40.0	1.25	20.0	0.60	50.0	0.72	40.0	0.72	40.0	0.72	40.0	0.72	40.0	0.72	40.0	0.72	40.0
0.40	30.0	1.97	16.0	0.64	45.0	0.90	33.0	0.90	33.0	0.90	33.0	0.90	33.0	0.90	33.0	0.90	33.0
0.45	25.0	2.50	13.0	0.75	38.0	1.00	30.0	1.00	30.0	1.00	30.0	1.00	30.0	1.00	30.0	1.00	30.0
0.62	20.0	3.00	11.3	0.87	35.0	1.15	26.0	1.15	26.0	1.15	26.0	1.15	26.0	1.15	26.0	1.15	26.0
1.00	15.0	4.00	8.5	1.00	31.5	1.30	21.0	1.30	21.0	1.30	21.0	1.30	21.0	1.30	21.0	1.30	21.0
1.46	12.0	5.00	7.1	1.20	29.0	1.41	20.0	1.41	20.0	1.41	20.0	1.41	20.0	1.41	20.0	1.41	20.0
2.00	10.0	6.00	6.3	1.50	25.8	1.50	19.0	1.50	19.0	1.50	19.0	1.50	19.0	1.50	19.0	1.50	19.0
3.00	9.0	8.00	5.4	2.00	21.5	1.60	18.0	1.60	18.0	1.60	18.0	1.60	18.0	1.60	18.0	1.60	18.0
8.00	6.0			2.50	18.3	1.75	17.0	1.75	17.0	1.75	17.0	1.75	17.0	1.75	17.0	1.75	17.0
				3.00	15.8	1.80	16.5	1.80	16.5	1.80	16.5	1.80	16.5	1.80	16.5	1.80	16.5
				3.50	13.5	2.00	16.0	2.00	16.0	2.00	16.0	2.00	16.0	2.00	16.0	2.00	16.0
				4.00	11.9	2.25	15.0	2.25	15.0	2.25	15.0	2.25	15.0	2.25	15.0	2.25	15.0
				4.50	10.7	2.50	14.8	2.50	14.8	2.50	14.8	2.50	14.8	2.50	14.8	2.50	14.8
				5.00	10.0	2.75	14.0	2.75	14.0	2.75	14.0	2.75	14.0	2.75	14.0	2.75	14.0
				5.50	9.5	3.00	13.8	3.00	13.8	3.00	13.8	3.00	13.8	3.00	13.8	3.00	13.8
				6.00	9.0	8.00	13.5	8.00	13.5	8.00	13.5	8.00	13.5	8.00	13.5	8.00	13.5
				6.50	8.8												
				7.00	8.5												
				8.00	8.0												

B16

(Continued)

(Sheet 2 of 3)

Table B5 (Concluded)

M113A1			M60A2			M577A1			XM723			XM1		
Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.
0	100.0	0	65.0	0	100.0	0	100.0	0	100.0	0	52.0	0	52.0	
0.40	100.0	0.50	65.0	0.40	100.0	0.40	100.0	0.54	100.0	1.40	52.0	1.40	52.0	
0.40	80.0	1.00	44.0	0.40	80.0	0.40	80.0	0.54	60.0	1.50	52.0	1.50	52.0	
0.40	70.0	1.50	30.0	0.40	70.0	0.40	70.0	0.60	50.0	1.62	37.0	1.62	37.0	
0.43	60.0	2.00	20.0	0.43	60.0	0.43	60.0	0.64	45.0	1.72	30.0	1.72	30.0	
0.48	50.0	2.50	16.0	0.48	50.0	0.48	50.0	0.75	38.0	2.00	23.5	2.00	23.5	
0.50	43.0	2.75	14.0	0.50	43.0	0.50	43.0	0.87	35.0	2.50	17.0	2.50	17.0	
0.55	40.0	3.00	13.0	0.55	40.0	0.55	40.0	1.00	31.5	2.80	14.5	2.80	14.5	
0.62	35.0	4.00	11.5	0.62	35.0	0.62	35.0	1.20	29.0	3.00	13.5	3.00	13.5	
0.75	30.0	5.00	10.5	0.75	30.0	0.75	30.0	1.50	25.8	3.50	11.5	3.50	11.5	
1.00	24.0	6.00	10.0	1.00	24.0	1.00	24.0	2.00	21.5	4.00	10.0	4.00	10.0	
1.23	20.0	8.00	9.0	1.23	20.0	1.23	20.0	2.50	18.3	5.00	8.5	5.00	8.5	
1.50	16.0			1.50	16.0	1.50	16.0	3.00	15.8	6.00	8.0	6.00	8.0	
1.80	14.0			1.80	14.0	1.80	14.0	3.50	13.5	7.00	7.5	7.00	7.5	
2.00	13.0			2.00	13.0	2.00	13.0	4.00	11.9	8.00	7.0	8.00	7.0	
2.50	11.0			2.50	11.0	2.50	11.0	4.50	10.7					
3.00	10.0			3.00	10.0	3.00	10.0	5.00	10.0					
3.50	9.0			3.50	9.0	3.50	9.0	5.50	9.5					
4.00	8.0			4.00	8.0	4.00	8.0	6.00	9.0					
5.00	7.0			5.00	7.0	5.00	7.0	6.50	8.8					
6.00	6.0			6.00	6.0	6.00	6.0	7.00	8.5					
8.00	5.0			8.00	5.0	8.00	5.0	8.00	8.0					

B17

Table B6

Roads and Trails Ride-Speed Relations for Vehicle Characteristic No. 55 in Table B1

M561			M35A2			M813			M656			MDW901			M520E1			M125E1		
Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	
0	100.0	0	100.0	0	100.0	0	100.0	0	100.0	0	100.0	0	100.0	0	100.0	0	100.0	0	100.0	
0.20	60.0	0.49	80.0	0.20	100.0	0.24	80.0	0.45	80.0	0.10	100.0	0.18	100.0	0.10	100.0	0.18	100.0	0.10	100.0	
0.50	36.0	0.50	60.0	0.20	80.0	0.25	50.0	0.50	50.0	0.20	40.0	0.30	68.0	0.20	40.0	0.30	68.0	0.20	40.0	
0.66	30.0	0.54	50.0	0.25	70.0	0.50	37.5	0.75	32.5	0.30	32.0	0.55	55.0	0.30	32.0	0.55	55.0	0.30	32.0	
1.00	23.5	0.61	40.0	0.37	60.0	0.75	30.5	1.00	27.9	0.40	28.0	0.80	40.0	0.40	28.0	0.80	40.0	0.40	28.0	
1.50	15.5	0.77	30.0	0.50	50.0	1.00	26.2	1.50	20.7	0.65	20.0	1.47	22.0	0.65	20.0	1.47	22.0	0.65	20.0	
2.00	10.6	0.93	25.0	0.68	40.0	2.00	11.8	2.00	16.3	1.00	15.0	2.20	10.0	1.00	15.0	2.20	10.0	1.00	15.0	
3.00	3.0	1.00	23.5	0.80	35.0	2.30	9.2	2.30	15.3	1.60	10.0	2.80	6.8	1.60	10.0	2.80	6.8	1.60	10.0	
8.00	2.9	1.50	15.0	0.95	30.0	3.00	9.2	3.00	15.3	2.30	6.0	8.00	6.0	2.30	6.0	8.00	6.0	2.30	6.0	
		2.00	10.5	1.21	24.0	8.00	9.2	8.00	15.3	8.00	5.5			8.00	5.5			8.00	5.5	
		3.00	4.8	1.42	20.0															
		8.00	2.0	1.75	15.0															
				2.00	11.8															
				2.13	10.0															
				2.22	9.0															
				2.45	7.0															
				2.60	6.0															
				2.80	5.0															
				3.00	4.5															
				8.00	4.5															

B18

B18

(Continued)

(Sheet 1 of 3)

Table B6 (Continued)

MS48E1			UET			ASV-Armored			M109A1			M107			M110E2		
Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed rms in.	Speed mph	Ele- vation rms in.	Speed rms in.	Speed mph
0	100.0	0	100.0	0	100.0	0	100.0	0	100.0	0	100.0	0	100.0	0	0	100.0	100.0
0.41	80.0	1.07	42.0	0.54	100.0	0.54	100.0	0.45	100.0	0.45	100.0	0.45	100.0	0.45	0.45	100.0	100.0
0.42	60.0	1.13	35.0	0.54	66.0	0.54	66.0	0.75	60.0	0.75	60.0	0.75	60.0	0.75	0.75	60.0	60.0
0.43	40.0	1.25	27.0	0.75	55.0	0.75	55.0	0.85	50.0	0.85	50.0	0.85	50.0	0.85	0.85	50.0	50.0
0.50	33.1	1.97	17.6	1.00	44.0	1.00	44.0	0.93	40.0	0.93	40.0	0.93	40.0	0.93	0.93	40.0	40.0
0.79	25.0	2.50	13.0	1.50	34.0	1.50	34.0	1.15	28.0	1.15	28.0	1.15	28.0	1.15	1.15	28.0	28.0
1.00	21.8	3.00	11.3	2.10	24.0	2.10	24.0	1.35	19.0	1.35	19.0	1.35	19.0	1.35	1.35	19.0	19.0
1.60	15.0	4.00	8.5	2.50	18.3	2.50	18.3	1.50	18.0	1.50	18.0	1.50	18.0	1.50	1.50	18.0	18.0
2.00	11.2	5.00	7.1	3.00	15.8	3.00	15.8	2.00	16.0	2.00	16.0	2.00	16.0	2.00	2.00	16.0	16.0
3.00	9.0	6.00	6.3	3.50	13.5	3.50	13.5	3.00	14.5	3.00	14.5	3.00	14.5	3.00	3.00	14.5	14.5
8.00	7.5	8.00	5.4	4.00	11.9	4.00	11.9	8.00	8.0	8.00	8.0	8.00	8.0	8.00	8.00	8.0	8.0
				4.50	10.7	4.50	10.7										
				5.00	10.0	5.00	10.0										
				5.50	9.5	5.50	9.5										
				6.00	9.0	6.00	9.0										
				6.50	8.8	6.50	8.8										
				7.00	8.5	7.00	8.5										
				8.00	8.5	8.00	8.5										

B19

(Continued)

(Sheet 2 of 3)

Table B6 (Concluded)

M113A1			M60A2			M577A1			XM723			X21		
Ele- vation rms in.	Speed mph	Ele- vation rms in.	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph	Ele- vation rms in.	Speed mph
0	100.0	0	0	65.0	0	100.0	0	100.0	0	100.0	0	52.0	0	52.0
0.40	100.0	0.50	0.50	65.0	0.40	100.0	0.40	100.0	0.54	100.0	1.40	52.0	1.40	52.0
0.40	80.0	1.00	1.00	44.0	0.40	80.0	0.40	80.0	0.54	66.0	1.50	52.0	1.50	52.0
0.43	73.5	1.50	1.50	30.0	0.43	73.5	0.43	73.5	0.75	55.0	1.62	37.0	1.62	37.0
0.48	66.8	2.00	2.00	20.0	0.48	66.8	0.48	66.8	1.00	44.0	1.72	30.0	1.72	30.0
0.53	60.0	2.50	2.50	16.0	0.53	60.0	0.53	60.0	1.50	34.0	2.00	23.5	2.00	23.5
0.65	50.0	2.75	2.75	14.0	0.65	50.0	0.65	50.0	2.10	24.0	2.50	17.0	2.50	17.0
0.82	40.0	3.00	3.00	13.0	0.82	40.0	0.82	40.0	2.50	18.3	2.80	14.5	2.80	14.5
1.00	33.5	4.00	4.00	11.5	1.00	33.5	1.00	33.5	3.00	15.8	3.00	13.5	3.00	13.5
1.22	27.5	5.00	5.00	10.5	1.22	27.5	1.22	27.5	3.50	13.5	3.50	11.5	3.50	11.5
1.43	23.2	6.00	6.00	10.0	1.43	23.2	1.43	23.2	4.00	11.9	4.00	10.0	4.00	10.0
1.66	20.0	8.00	8.00	9.0	1.66	20.0	1.66	20.0	4.50	10.7	5.00	8.5	5.00	8.5
1.83	17.2				1.83	17.2	1.83	17.2	5.00	10.0	6.00	8.0	6.00	8.0
2.00	15.0				2.00	15.0	2.00	15.0	5.50	9.5	7.00	7.5	7.00	7.5
2.50	11.5				2.50	11.5	2.50	11.5	6.00	9.0	8.00	7.0	8.00	7.0
3.00	10.0				3.00	10.0	3.00	10.0	6.50	8.8				
3.50	9.0				3.50	9.0	3.50	9.0	7.00	8.5				
4.00	8.0				4.00	8.0	4.00	8.0	8.00	8.5				
5.00	7.0				5.00	7.0	5.00	7.0						
6.00	6.0				6.00	6.0	6.00	6.0						
8.00	5.0				8.00	5.0	8.00	5.0						

B2D

APPENDIX C: RESULTS OF EXPERIMENTAL DYNAMICS TESTS

Test Objectives and Scope

1. It was necessary to conduct a few experimental tests to fill certain voids in the existing vehicle ride and shock data base. As a result, ride and shock tests were conducted at Fort Sill, Oklahoma, with a selected group of vehicle-artillery configurations and two self-propelled artillery pieces over selected secondary roads, trails and cross-country courses.

2. Since experimental data were already available on most of the prime movers of interest, the main purpose of the tests was to determine the effects of the towed load on the ride quality of the prime movers and to develop ride and shock relations for the two self-propelled artillery pieces for which no data existed.

Vehicle Configurations

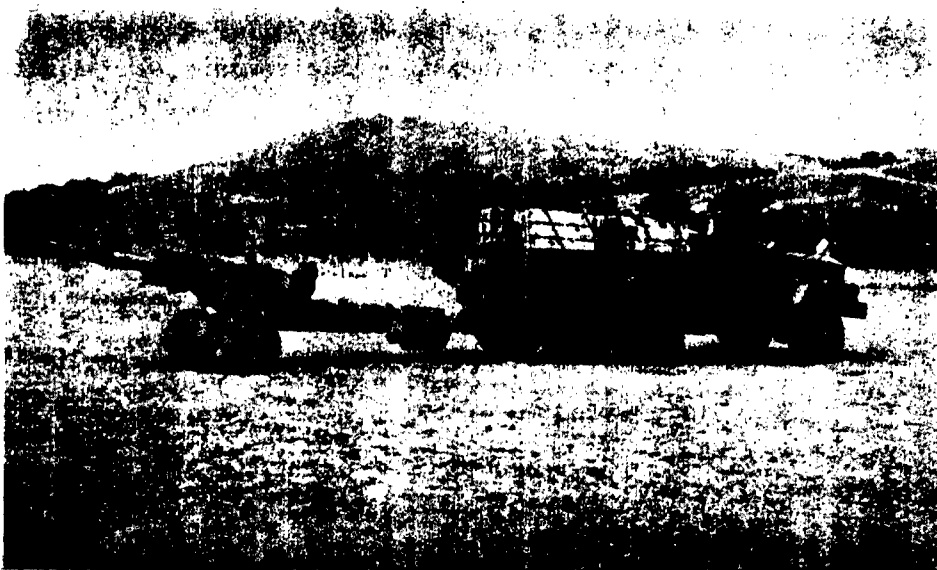
3. Vehicle breakdowns, maintenance requirements, and adverse weather and time constraints limited the testing to the following seven configurations:

- a. M35A2-XM198
- b. M35A2-M102
- c. M813-XM198
- d. M520E1-XM198
- e. M561-M102
- f. M109A1
- g. M110E2
- h. M813

The vehicle configurations, except h above, are shown in Figure C1.

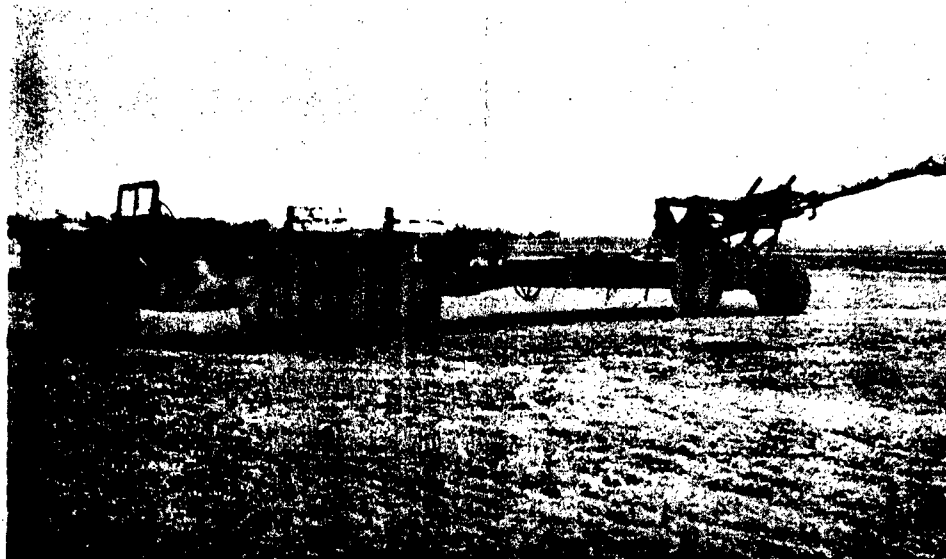


a. M35A2-XM198

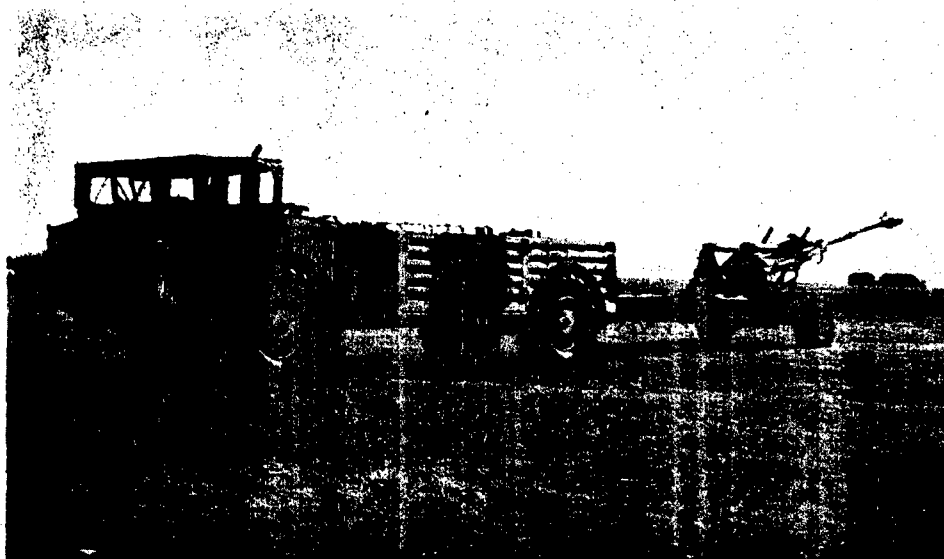


b. M35A2-M102

Figure C1. Test vehicles (sheet 1 of 4)

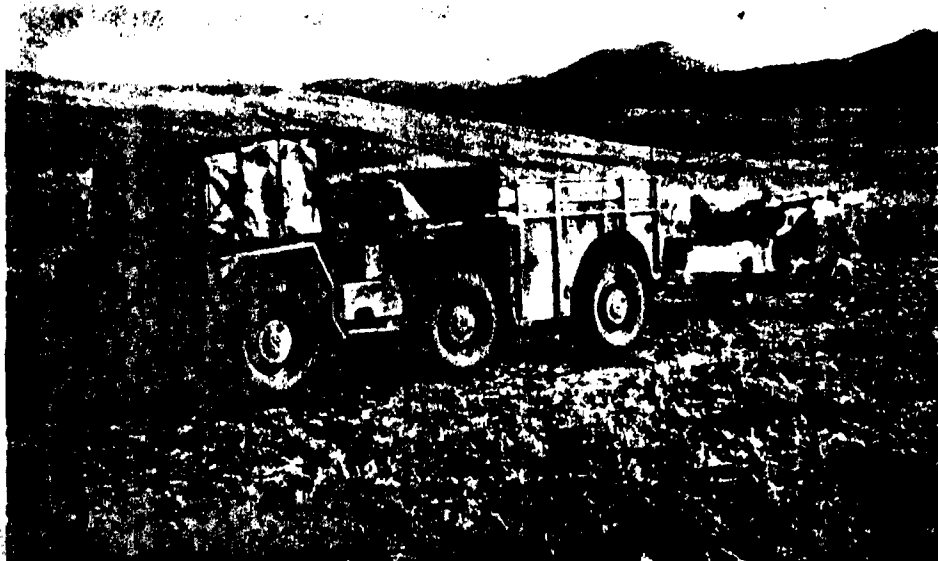


c. M813-XM198

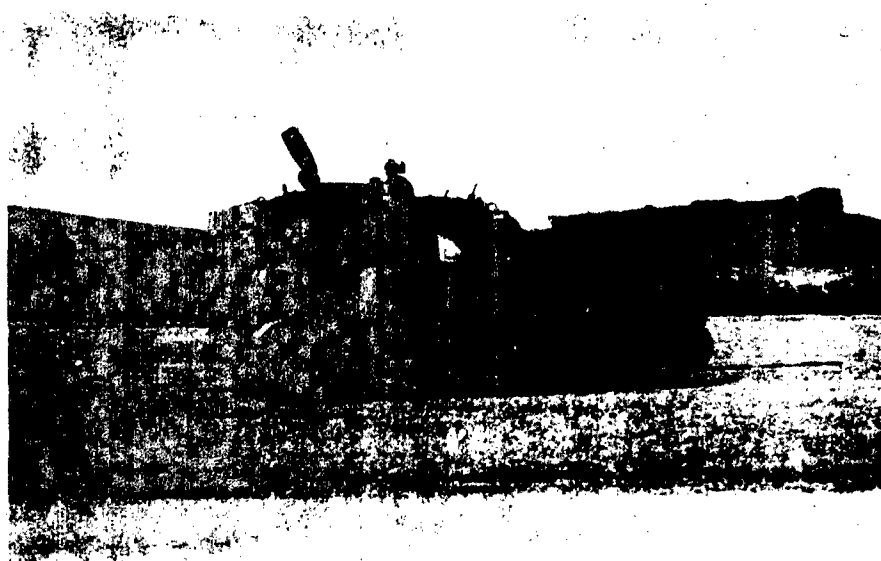


d. M520E1-XM198

Figure C1 (sheet 2 of 4)

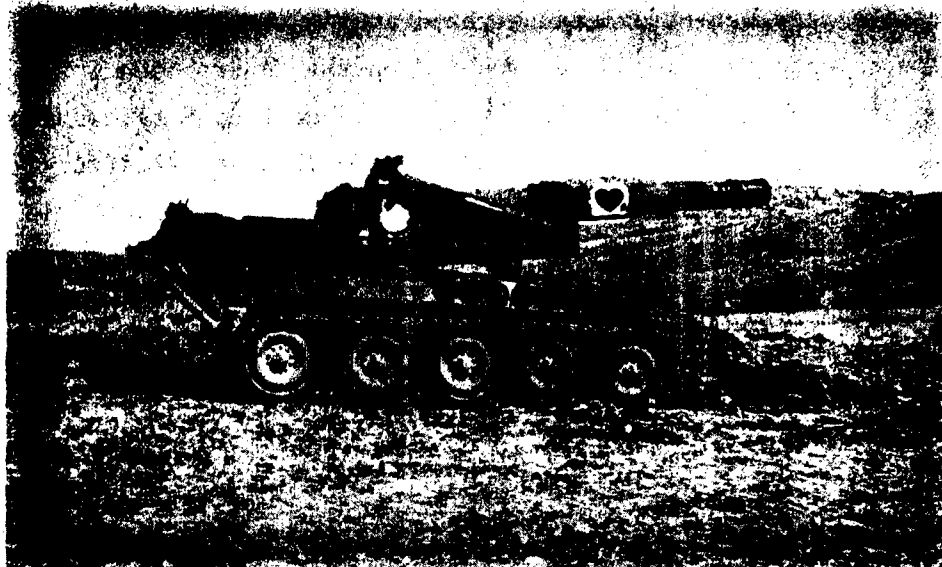


e. M561-M102



f. M109A1

Figure C1 (sheet 3 of 4)



g. M110E2

Figure C1 (sheet 4 of 4)

Instrumentation for Measuring Ride and Shock Responses

4. The instrumentation for measuring ride and shock responses consisted of: (a) three orthogonally positioned linear accelerometers and two angular accelerometers mounted near the geometric center of the cargo area to measure the bounce, fore-to-aft, side-to-side, and pitch-and-roll accelerations in the cargo area; (b) three orthogonally positioned linear accelerometers mounted on the driver's seat and connected to a portable ride meter to measure the driver's absorbed power; (c) one vertically oriented accelerometer mounted on the floor beneath the driver's seat; and (d) one vertically oriented accelerometer mounted on each towed artillery piece. For the two self-propelled artillery vehicles, the cargo instrumentation was placed as near as possible to the vehicle's center of gravity. All signals were recorded on FM magnetic tape by a 14-channel heavy-duty recorder and its associated signal processor and 30-V battery power source, which were also mounted on the vehicle (Figures C2-C5). The ride meter converted the acceleration signals at the driver's seat to absorbed power. In addition to being recorded on tape, absorbed power was displayed continuously on a meter for visual observation of the responses occurring during each test. Also, the ride meter contained a peak counter that detected and counted the number of peak accelerations falling within six distinct intervals. The intervals are variable and are selected on the basis of the range of acceleration expected. The elapsed time and time-averaged absorbed power were obtained from a digital meter at the end of each test.

5. Absorbed power is the measure of the rate at which vibrational energy is absorbed by a human and is the quantity currently used to determine human tolerance to vibration when a vehicle is negotiating rough terrain. Ride quality is currently based on the vertical absorbed power at the driver's seat. The results of a comprehensive laboratory test program led to the establishment of a criterion of six watts as the human tolerance limit. The details of its development can be found in References 8 and 9. Experience from past tests based on comments of the

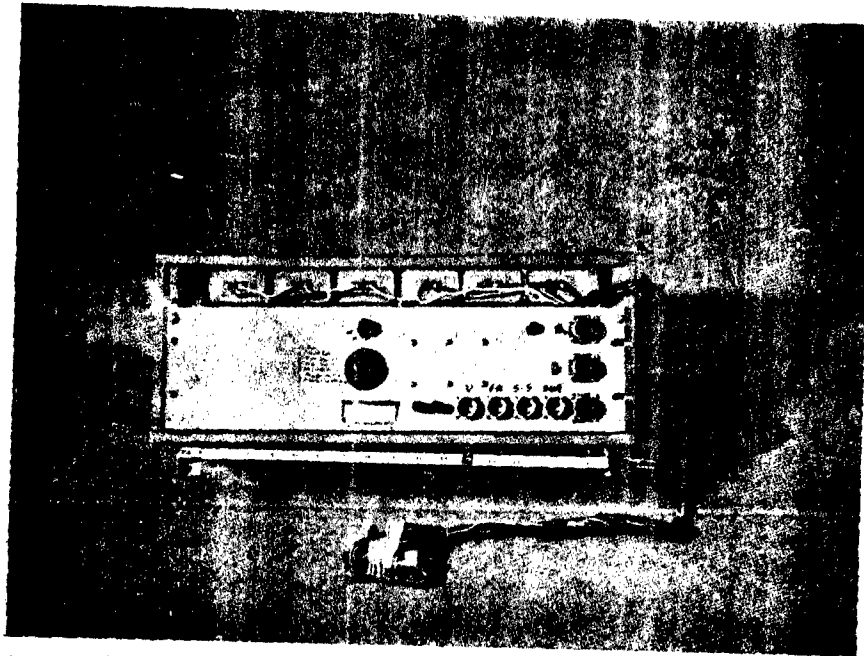


Figure C2. Portable ride meter and associated accelerometers

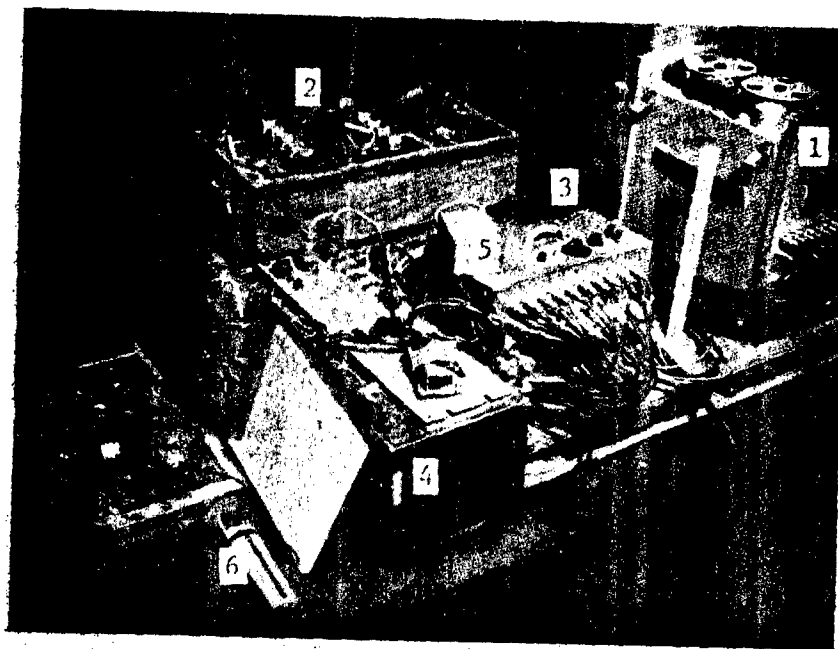


Figure C3. Basic instrumentation recording components

LEGEND:

- (1) Tape recorder
- (2) 30-v power source
- (3) Signal controller
- (4) Ride meter
- (5) Absorbed power display
- (6) Voltmeter with averaging circuit

C7

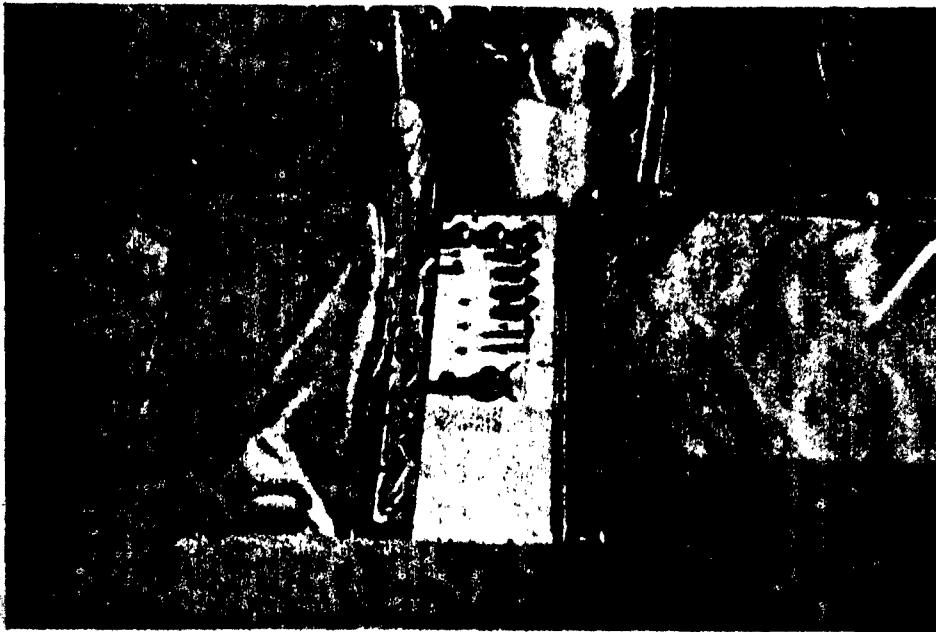


Figure C4. Ride meter installed for vehicle test

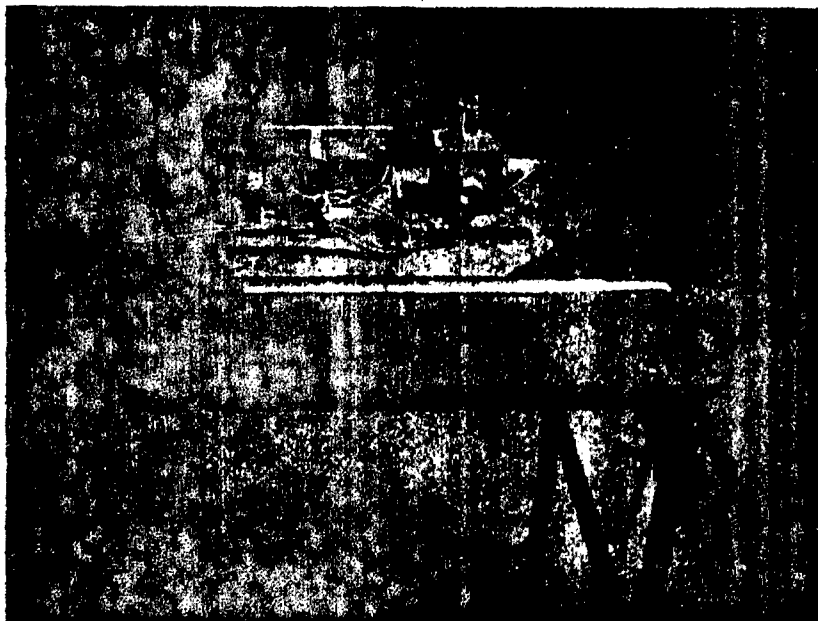


Figure C5. Accelerometer mount for cargo area

Legend

- 1 - Linear accelerometers
- 2 - Rotational (angular) accelerometers

vehicle drivers and occupants has indicated that the vibrational environment affecting ride quality is influenced significantly by horizontal motion. Studies are being made to ascertain this influence and develop relations that include both vertical and horizontal motions. It has been observed that horizontal motions, particularly the fore-and-aft, are more predominant in vehicles pulling heavy towed loads. However, because there are as of now no usable relations that include horizontal motions, ride quality for this study was defined in terms of vertical absorbed power.

General Description of Terrain and Climate
of Fort Sill, Oklahoma

6. The Fort Sill Reservation lies within Comanche County, Oklahoma, and occupies almost 6 of the county's 36 km². About 51 percent of the land consists of sloping prairies and plains having less than 3 percent slope; about 20 percent is rolling with slopes from 3 to 5 percent; and 29 percent has slopes more than 5 percent, which includes Granite and Limestone Mountains. About 52 percent of Fort Sill is within the East Coche Creek watershed, 40 percent lies within the West Coche Creek watershed, and 8 percent is in the Big Beaver Creek watershed.

7. The geologic formations of Fort Sill consist of igneous and sedimentary rocks. Most of the soils are underlain by sedimentary rocks composed of fragments of older rocks.

8. The Fort Sill area has a temperate, continental climate of dry, subhumid type. The weather patterns that influence this area are sustained by the alternate movement of warm, moist air from the Gulf of Mexico and of either contrasting cooler, modified marine air from the West Coast or colder, dry air from around the Arctic Circle. Rapid changes are common and result in distinct fluctuations of temperature, humidity, cloudiness, wind, and precipitation.

Ride Test Courses

Location

9. All courses were in the same general area of the Fort Sill Military Reservation near the west gate. Geographic coordinates of the area and location of the test sites are given in Figure C6. To provide a representative group of surface conditions, test courses were selected as follows:

- a. One secondary road (designated as FSSR1)
- b. Four trails (designated FST1 through FST4)
- c. Five cross-country courses (designated as FSCC2 through FSCC6)

Course FSCC1 was determined unsuitable and eliminated from the program. Photographs of the courses are shown in Figure C7.

10. A profile of each course was measured with rod and level at 1-ft intervals, and surface roughness (rms elevation) was determined from these profiles using current procedures which filter out frequency components having wavelengths greater than 60 ft. The course lengths and rms elevations are listed in the tabulation below.

<u>Test Course</u>	<u>Length, ft</u>	<u>Elevation, rms in</u>
FSSR1	400	0.09
FST1	300	1.24
FST2	300	0.51
FST3	250	1.01
FST4	250	1.44
FSCC2	400	1.74
FSCC3	300	0.92
FSCC4	400	0.69
FSCC5	300	0.87
FSCC6	300	1.29

Obstacle-Impact Test Course

11. Rigid, semicircular obstacles 6, 8, and 12 in. high were positioned in a line on a level, hard surface. A 100-ft distance was measured perpendicular to the obstacles, and stakes, used to determine

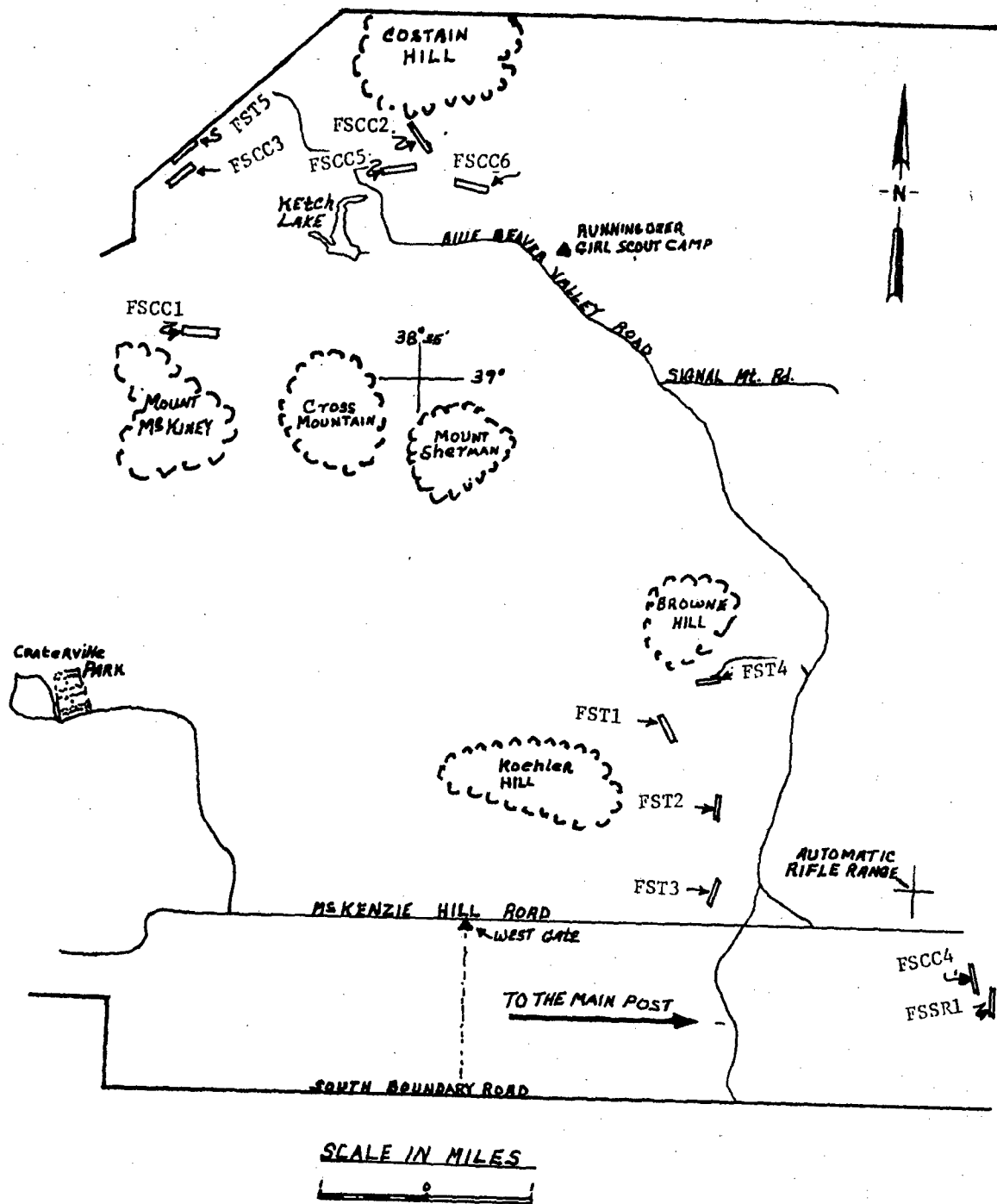
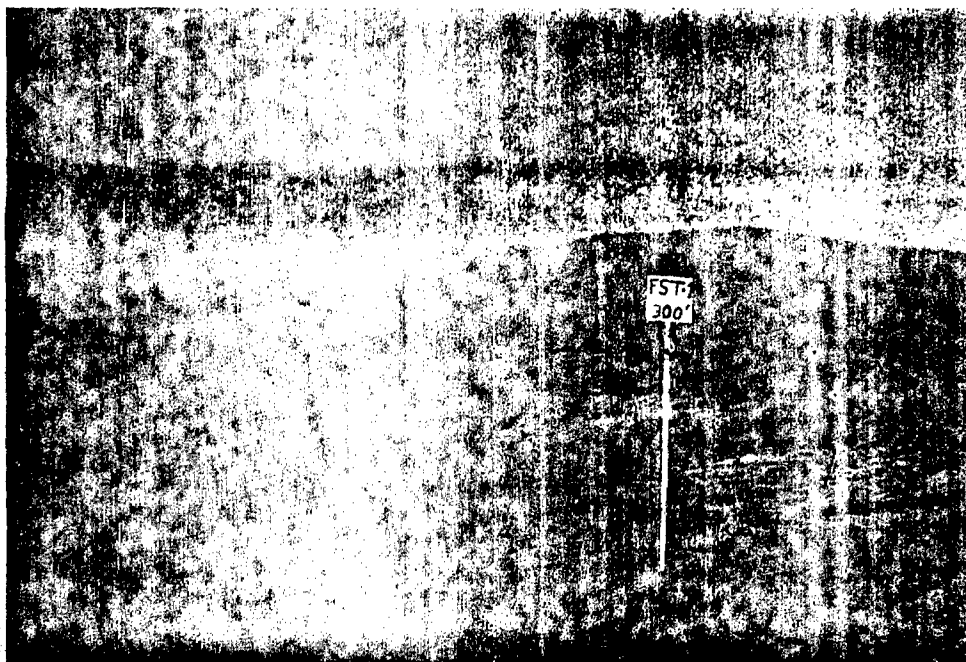


Figure C6. Location of ride test courses

C11



a. Fort Sill secondary road 1



b. Fort Sill trail 1

Figure C7. Test courses (sheet 1 of 5)



c. Fort Sill trail 2



d. Fort Sill trail 3

Figure C7 (sheet 2 of 5)



e. Fort Sill trail 4



f. Fort Sill cross-country 2

Figure C7 (sheet 3 of 5)



g. Fort Sill cross-country 3

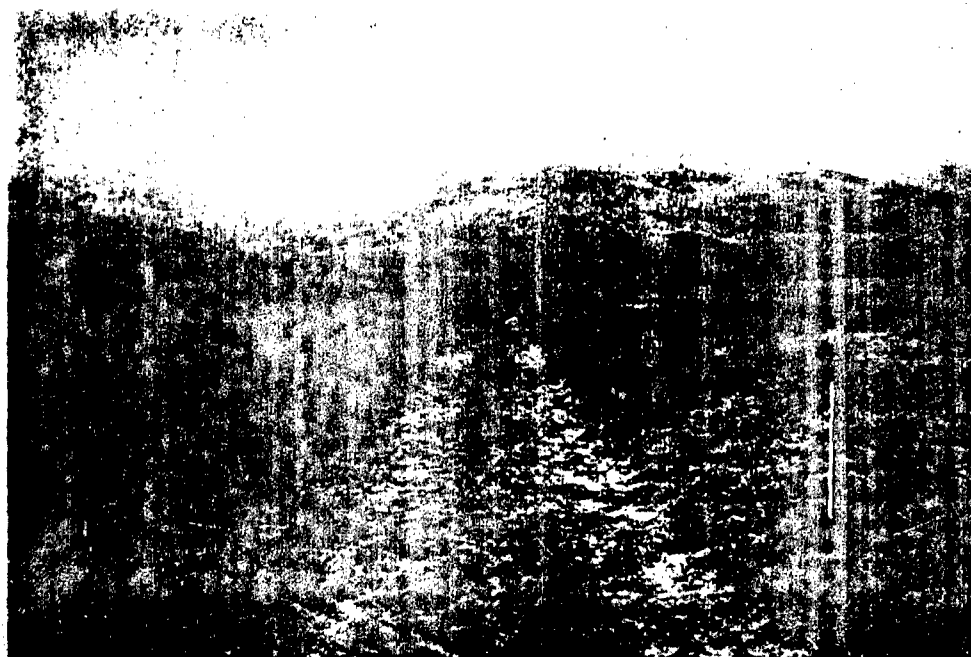


h. Fort Sill cross-country 4

Figure C7 (sheet 4 of 5)



i. Fort Sill cross-country 5



j. Fort Sill cross-country 6

Figure C7 (sheet 5 of 5)

the impact speed by timing, were driven into the ground at that point. A sketch of the obstacle course is shown in Figure C8.

Test Procedures

Preparation of vehicles for testing

12. The vehicles were serviced and checked before testing to ensure peak mechanical performance during all tests. When major mechanical problems developed, the vehicle was repaired or was replaced with a similar vehicle. Tests under loaded conditions were conducted at the recommended cross-country payloads or as near those payloads as could be determined using field loading techniques; boxes filled with soil were used as payload. Tires were inflated and maintained at the recommended cross-country tire pressures. Safety devices, such as seat belts, were used if the test vehicles were equipped with such devices.

Ride tests

13. Several tests were conducted with each vehicle configuration over each of the ride test courses at relatively constant speeds ranging from 5 mph to the maximum safe speed, usually in about 5-mph increments. The objective was to reach and, if possible, surpass the 6-watt ride limit. However, on occasion the combination of short approaches to the test courses and insufficient horsepower precluded reaching the 6-watt limit.

14. With a few exceptions, each test began with the vehicle positioned a sufficient distance from the beginning of the test course to enable the driver to reach the desired test speed before entering the test course. This speed was then maintained at a relatively constant level (using the vehicle's speedometer) throughout the length of the course. An observer rode in the vehicle during each test to operate and monitor the output of the ride meter and narrate the pertinent activities. This narrative was recorded on the voice channel of the magnetic tape. At the end of the test, the driver's comments were also recorded. Measurements and test procedures were designed to be completely

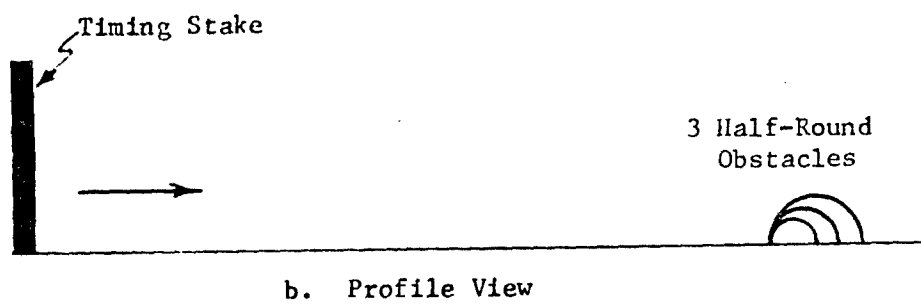
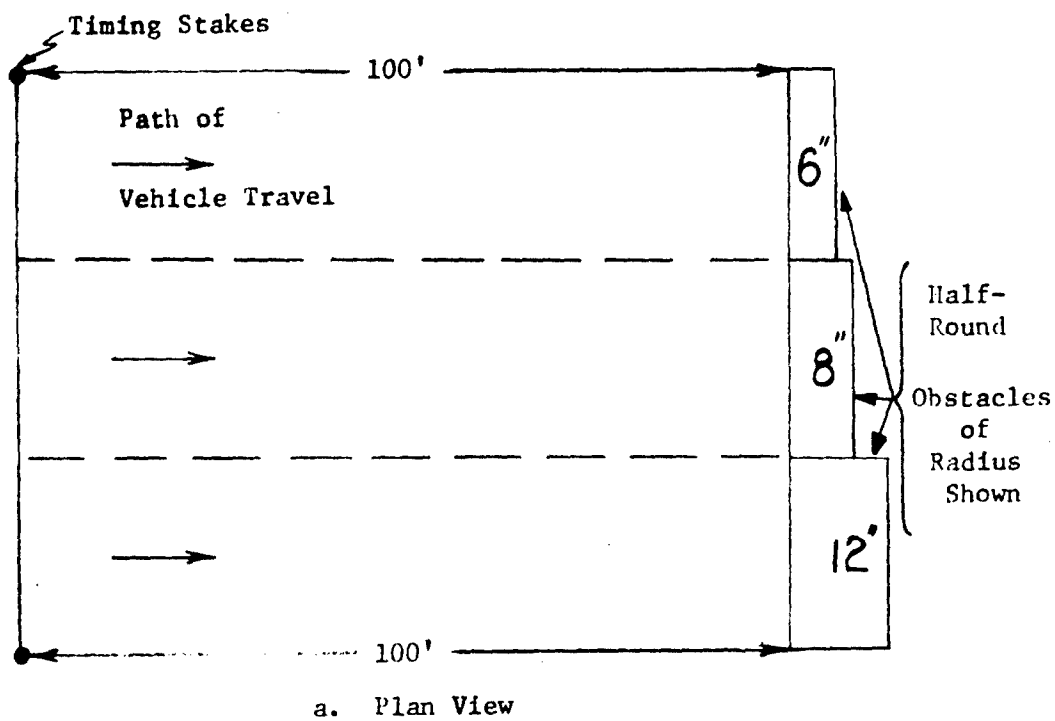


Figure C8. Schematic of obstacle impact course

independent of driver's judgment and provide a direct, objective measure of the vehicles' ride and vibration characteristics with changes in speed and surface roughness.

Shock tests

15. Four or five tests were conducted with each vehicle over each obstacle (6-, 8-, and 12-in. heights) at relatively constant speeds from 5 mph to the maximum safe speed, usually in increments of about 5 mph.

16. Each test began by positioning the test vehicle a sufficient distance from the 100-ft timing stake (see Figure C8) so that the driver could obtain the desired test speed before reaching the stake. He then maintained that speed to the best of his ability (using the vehicle's speedometer) until the vehicle had completely crossed the obstacle. The vehicle impact speed when contacting the obstacles was computed by dividing the 100-ft distance by the time elapsed between passage of the stakes and obstacle contact. An observer rode in the vehicle during each test to operate and monitor the output of the peak counter and narrate the pertinent activities.

Test Data Collected

17. For this study the principal data for the ride tests consisted of vertical absorbed power at the driver's location. However, absorbed power was calculated for side-to-side and fore-to-aft motions. The same data recorded for the ride tests were recorded also for the discrete-obstacle tests, but only the peak values of vertical accelerations beneath the driver's seat were considered in the shock analysis. The elapsed time and average speeds were determined for each ride and shock test. Although not used in the analysis, linear and angular accelerations were measured in the cargo area of vehicles with towed artillery and at the center of gravity of the two self-propelled pieces. The vertical accelerations of each towed piece were also measured. All measurements were recorded on magnetic tape.

Results

Ride tests

18. The Fort Sill Reservation did not offer the most desirable terrain for ride quality evaluations. The level areas that were best suited for ride courses were either relatively smooth, cluttered with boulders, pitted with craters from artillery bursts, or lined with erosion features. Although they were representative of that particular geographic region, they did not fit the pattern of virgin terrain representative of many areas of the world in which ride and shock test data have been collected. The lack of this general degree of random, uniformity in the surface composition and a suitable range of terrain roughness restricted the use of the results of these tests in developing correlations with existing ride and shock relations. The tests, however, did serve the purpose for which they were intended and that was to show the effects of towed artillery on the ride quality of the prime movers.

19. The rationale for the analysis was to use the results of two recently completed experimental programs for investigating the ride and shock qualities of a number of standard and advanced-concept vehicles, which included pulling a variety of trailers with solid and liquid payloads.^{5,10} The results indicated that, for the most part, the towed load did not produce any significant influence on the ride quality of the prime mover.

20. A special test sequence was conducted to confirm these previously defined relations. Tests were conducted with the M35A2, 2-1/2-ton, cargo truck pulling the M102 and the XM198. The weight of the XM198 was nearly five times that of the M102 (15,250-lb and 3,338-lb respectively) and produced artillery-to-prime mover weight ratios of 0.83 and 0.18. The M813, 5-ton, cargo truck was tested without a towed load and with the XM198, which produced artillery-to-prime mover weight ratios of 0.0 and 0.47, respectively. It was felt that this range of conditions would suitably reflect any effects of towed load on ride quality for standard cargo vehicles. The results followed the pattern of the previous study, i.e., there was no distinguishable influence on

ride quality by the towed load. This is reflected by the absorbed power-speed plots in Figures C9 through C12, which illustrate representative relations for the M35A2 and M813 configurations on two cross-country courses. The intermingling of the data substantiate that ride quality was not influenced by the towed load.

21. The next sequence of tests concerned two advanced-concept vehicles; the M520E1 towing the XM198 and the M561 towing the M102. The intent of these tests was to provide ride data with towed artillery to compare with ride data obtained from other tests with the prime movers operating without towed loads.

22. Figure C13 shows cross-country absorbed power-speed relations for the M520E1 with and without the towed artillery. The open symbols represent data obtained at Fort Sill with the XM198. The closed symbols represent data obtained in a previous program at Fort Hood, Texas, with the M520E1 operating without a towed load. The intermingling of the data again reflects that, as with the standard cargo vehicles, there is no effect of the towed load on the prime mover. Two separate relations are illustrated by the two lines drawn through the data. One relation is for data on the courses with surface roughness values ranging from 0.87 to 2.0 in. (rms) and the other for those with surface roughness values of 0.50 and 0.69 in. (rms).

23. The results of the M561 tests were not as well defined as those for the M35A2, M813, and M520E1 configurations. The absorbed power-speed data for the cross-country courses are plotted in Figure C14. Unfortunately, because of rain and vehicle breakdowns, tests with the M561 were restricted to only three of the six cross-country courses. The data reflect those obtained in the Fort Sill tests with the M561 pulling the M102 and those obtained in a previous program at Fort Hood with the M561 operating without a towed load. The data separate by surface roughness. Since the surface roughnesses of the courses at Fort Hood were different from those at Fort Sill, direct comparisons could not be made on the basis of the absorbed power-speed relations. Consequently, comparisons were made on the basis of the ride-limiting speed (the speed at which the 6-watt absorbed power level occurred)

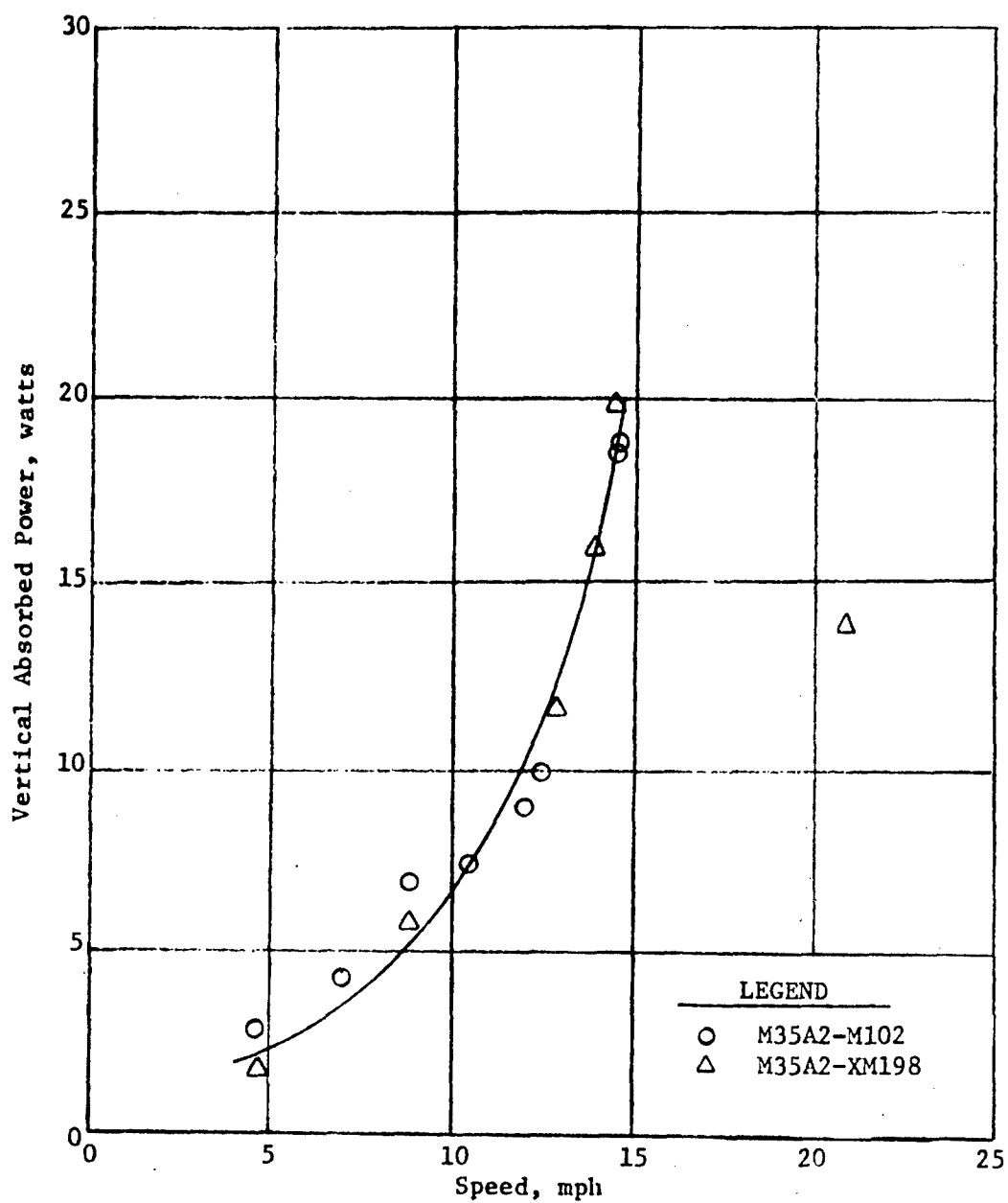


Figure C9. Vertical absorbed power-speed relations for M35A2 configurations on course FSCC2

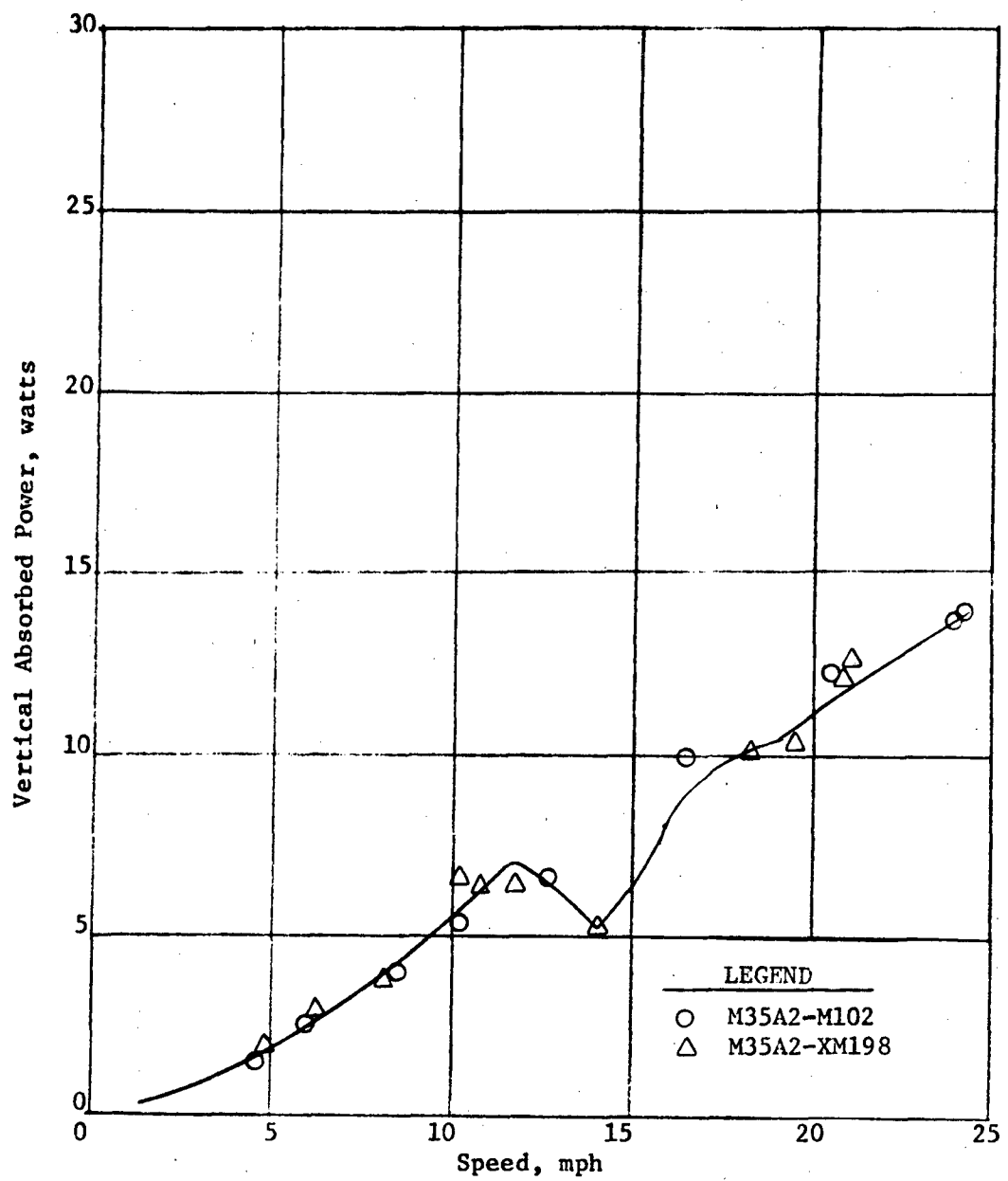


Figure C10. Vertical absorbed power-speed relations for M35A2 configurations on course FSCC3

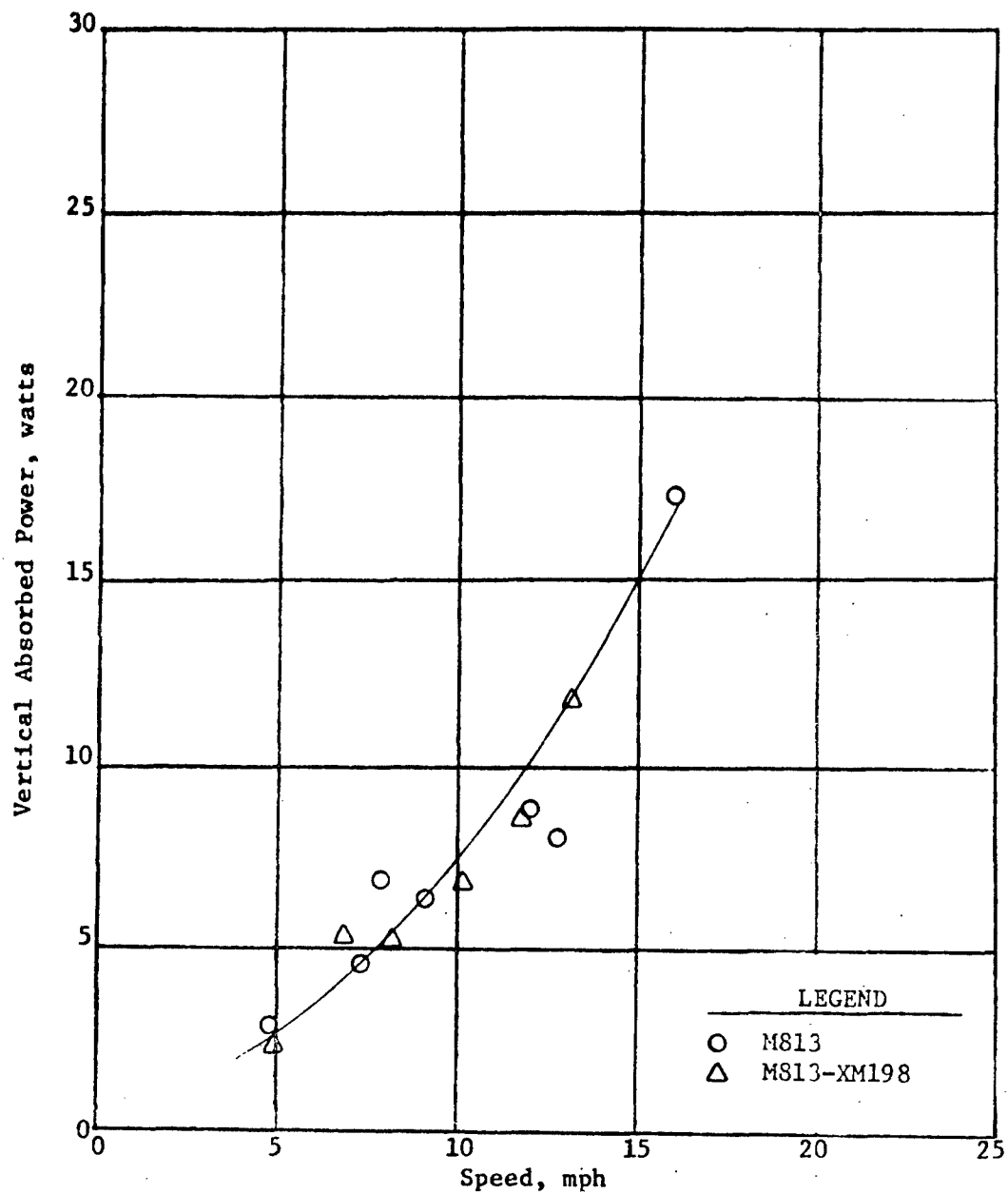


Figure C11. Vertical absorbed power-speed relations for M813 configurations on course FSCC2

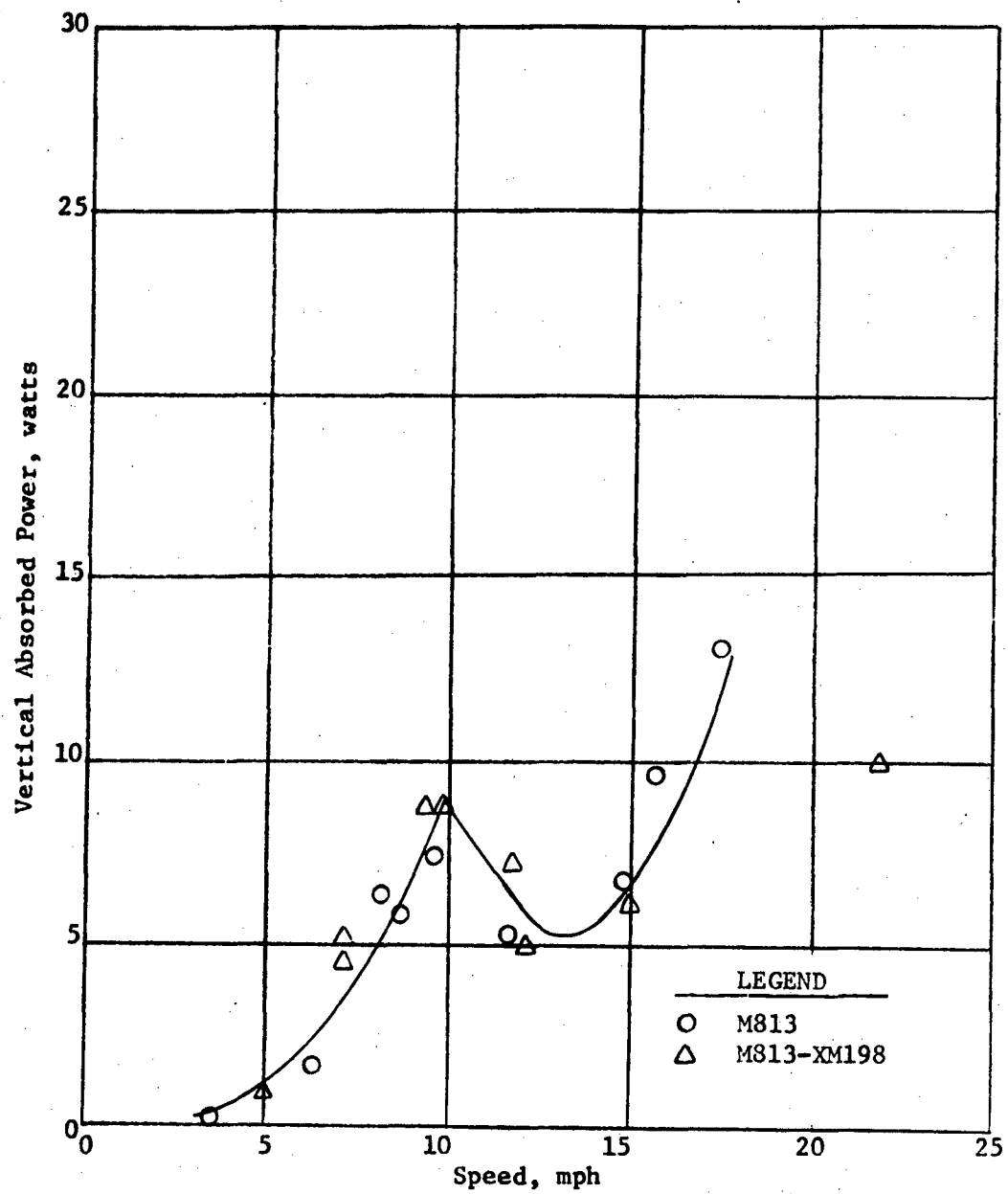


Figure C12. Vertical absorbed power-speed relations for M813 configurations on course FSCC3

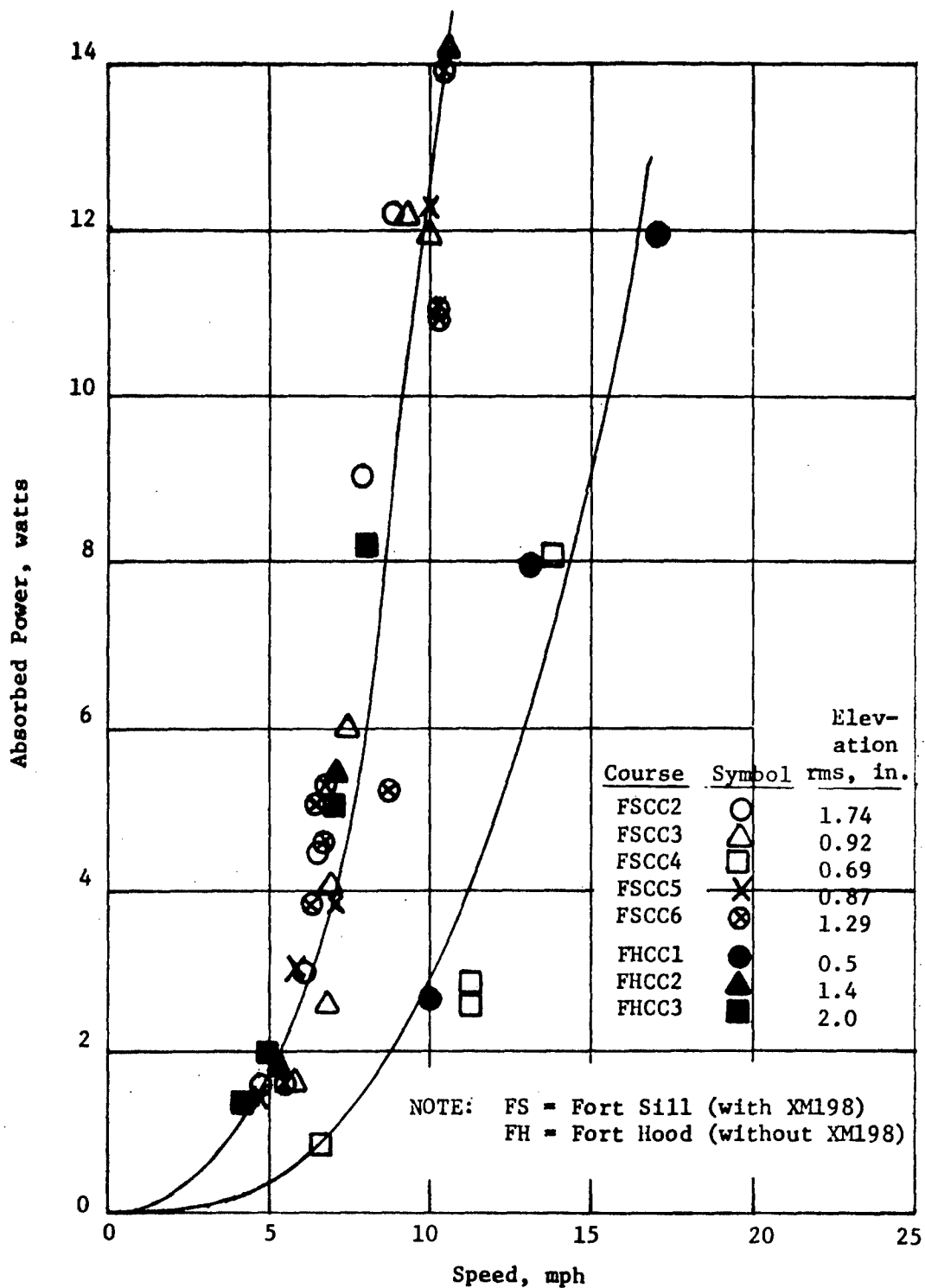


Figure C13. Cross-country absorbed power-speed relations for M520E1 with and without the XM198

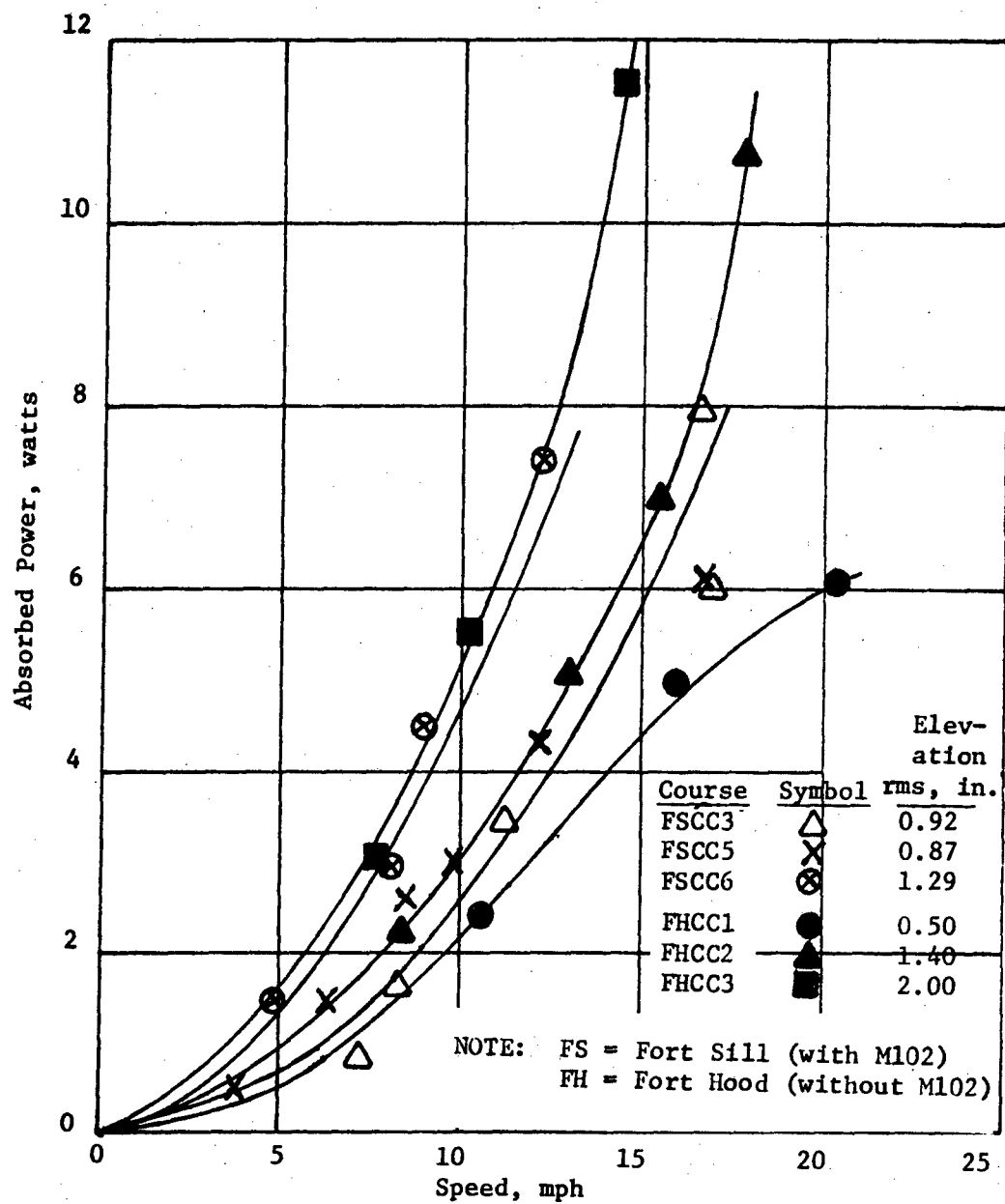


Figure C14. Absorbed power-speed relation for M561 with and without the towed M102

versus surface roughness relation (Figure C15). Only two points were available from the Fort Sill tests since two of the courses were of about the same level of roughness and produced similar ride responses (see Figure C14). These two points, along with the three obtained from the Fort Hood tests, are plotted with the curve representing the established ride relation for the M561 operating without a towed load. This curve was established from the results of the Fort Hood tests. A deviation from the curve of less than 2 mph is noted for one of the Fort Sill test coordinates; the other falls very close to the curve. This deviation is within the accepted data scatter since it has been established from other test data that variations of 2 mph are not significant. Although the data for this configuration are meager, it is felt justified to assume there is no effect of the towed load on ride quality.

24. Experimental ride data are completely non-existent for self-propelled artillery. Consequently, a rather extensive testing program was anticipated with the M109A1 and M110E1 self-propelled pieces to define ride relations for those type of vehicles. Although a substantial number of tests were conducted with each of these vehicles, the results were not as definitive as had been desired. On most courses, the 6-watt tolerance limit was not reached because the approaches limited the vehicles' top speeds. Both the data and comments of the drivers confirmed that the two vehicles had similar ride characteristics. The similarity in the ride of the two vehicles is illustrated in Figure C16 by the absorbed power-speed plots which represent the results for the two vehicles operating on a cross-country and two trail courses. These are the only courses that produced any significant levels of absorbed power. By assuming that the vehicles had the same ride characteristics, ride relations were developed by extrapolating the data and using judgment based on past experience. The resulting relations for cross-country and trails are shown in Figure C17. The ride relations for the other vehicles tested in this program are shown in Figures C18-C21. A distinction is made between cross-country courses and trail courses, and separate relations are drawn because past experience with ride tests on

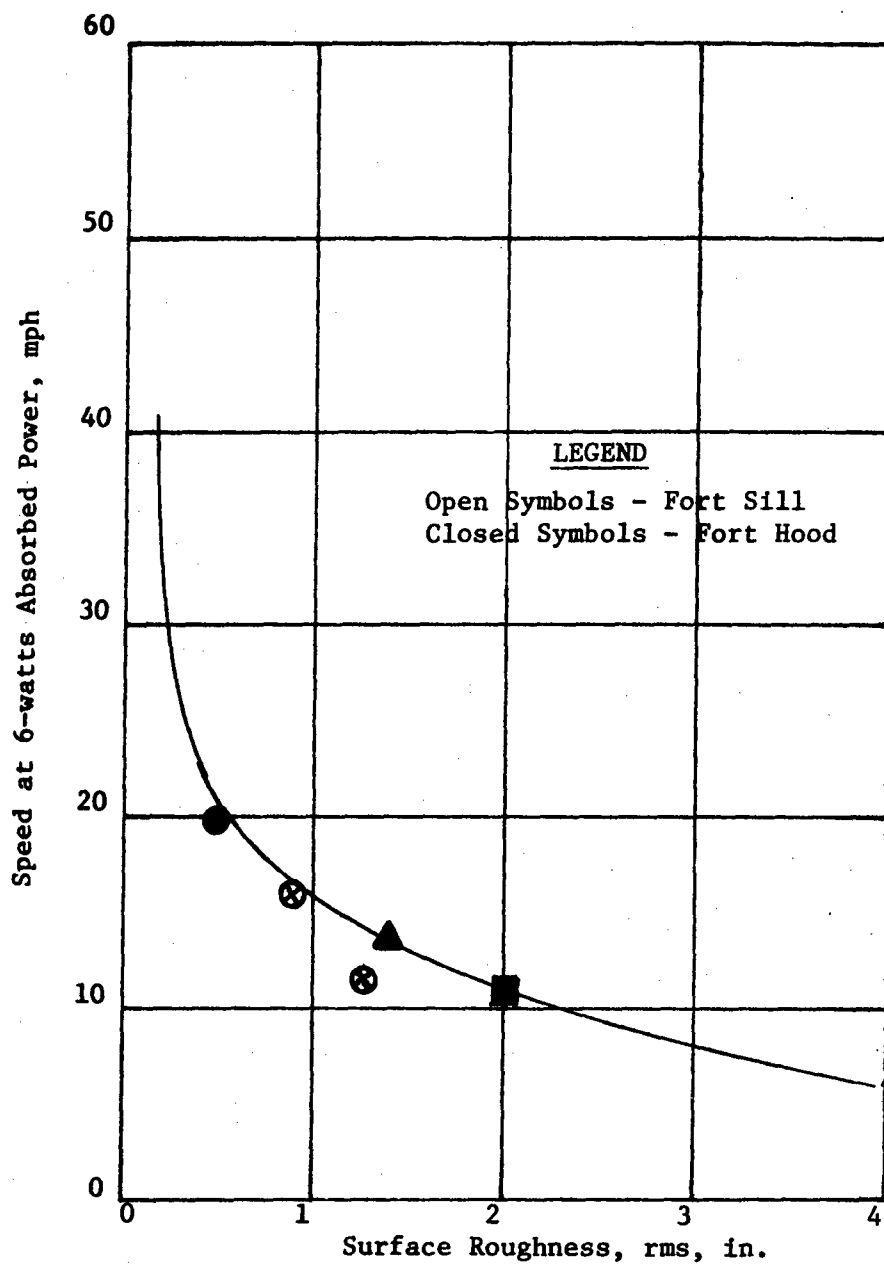


Figure C15. Ride limiting speed-surface roughness relation for M561

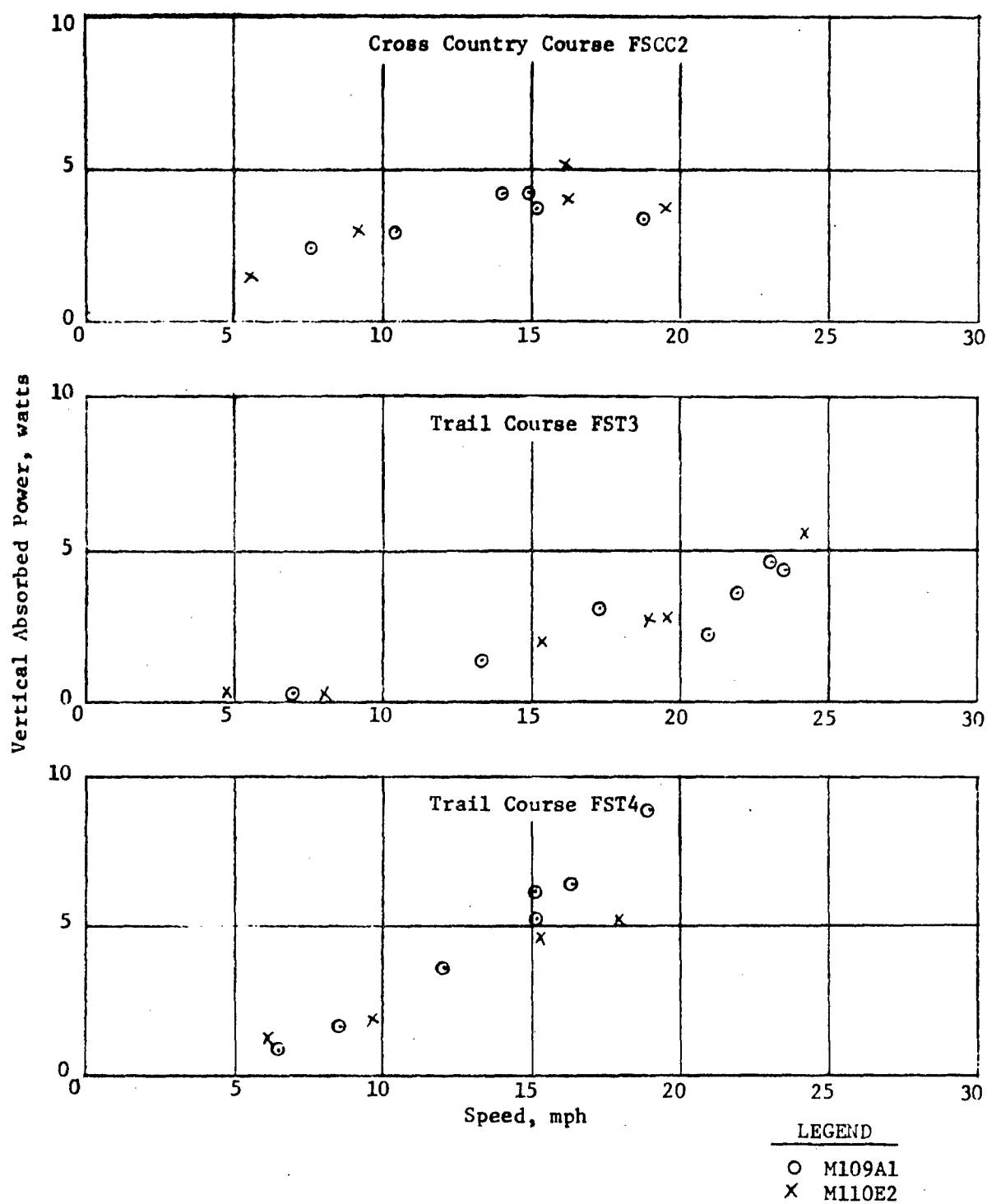


Figure C16. Absorbed power-speed relations for the M109A1 and M110E2 self-propelled artillery on selected cross-country and trail courses

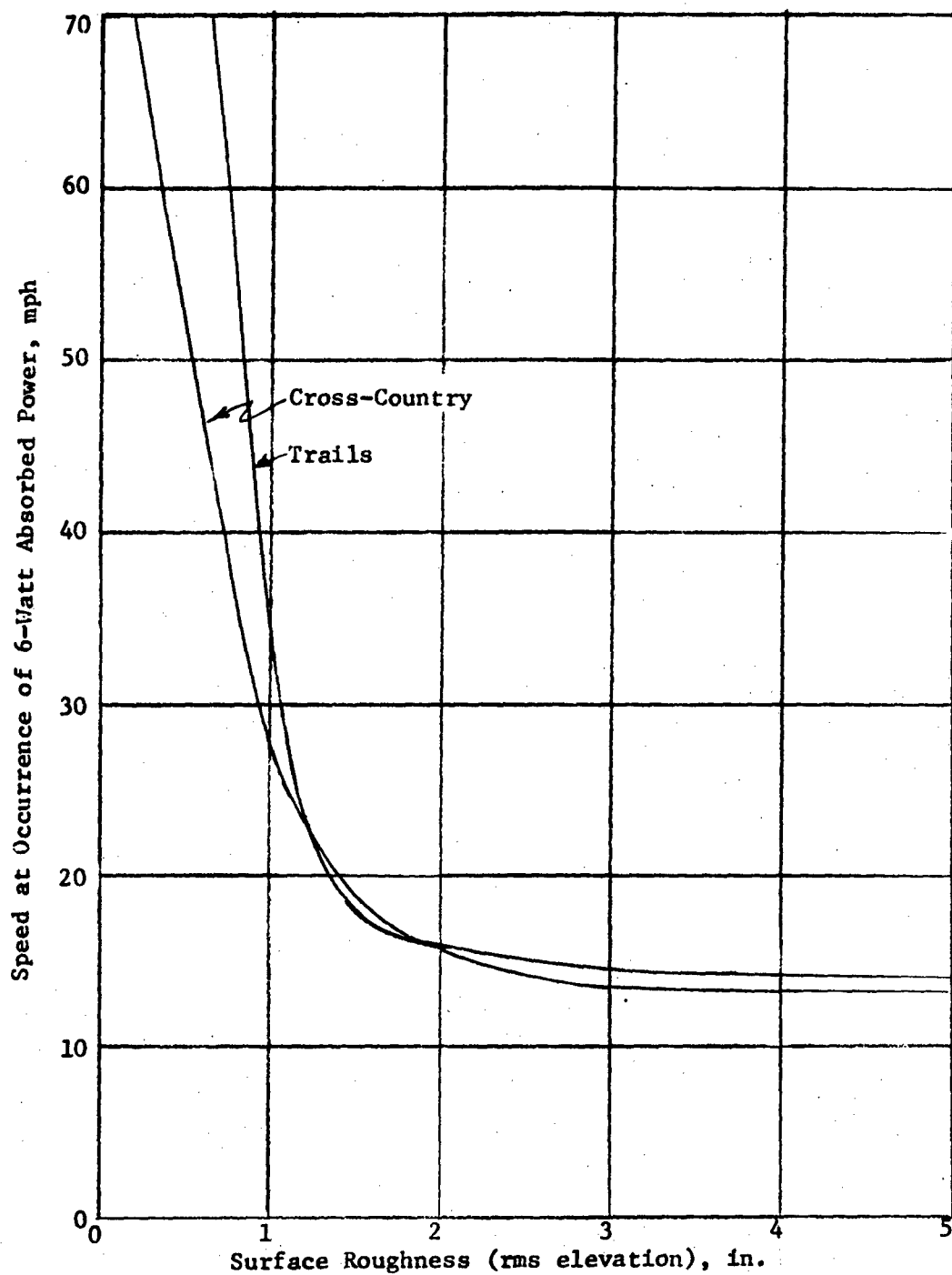


Figure C17. Ride limiting speed-surface roughness relations for M109A1 and M110E2 self-propelled artillery

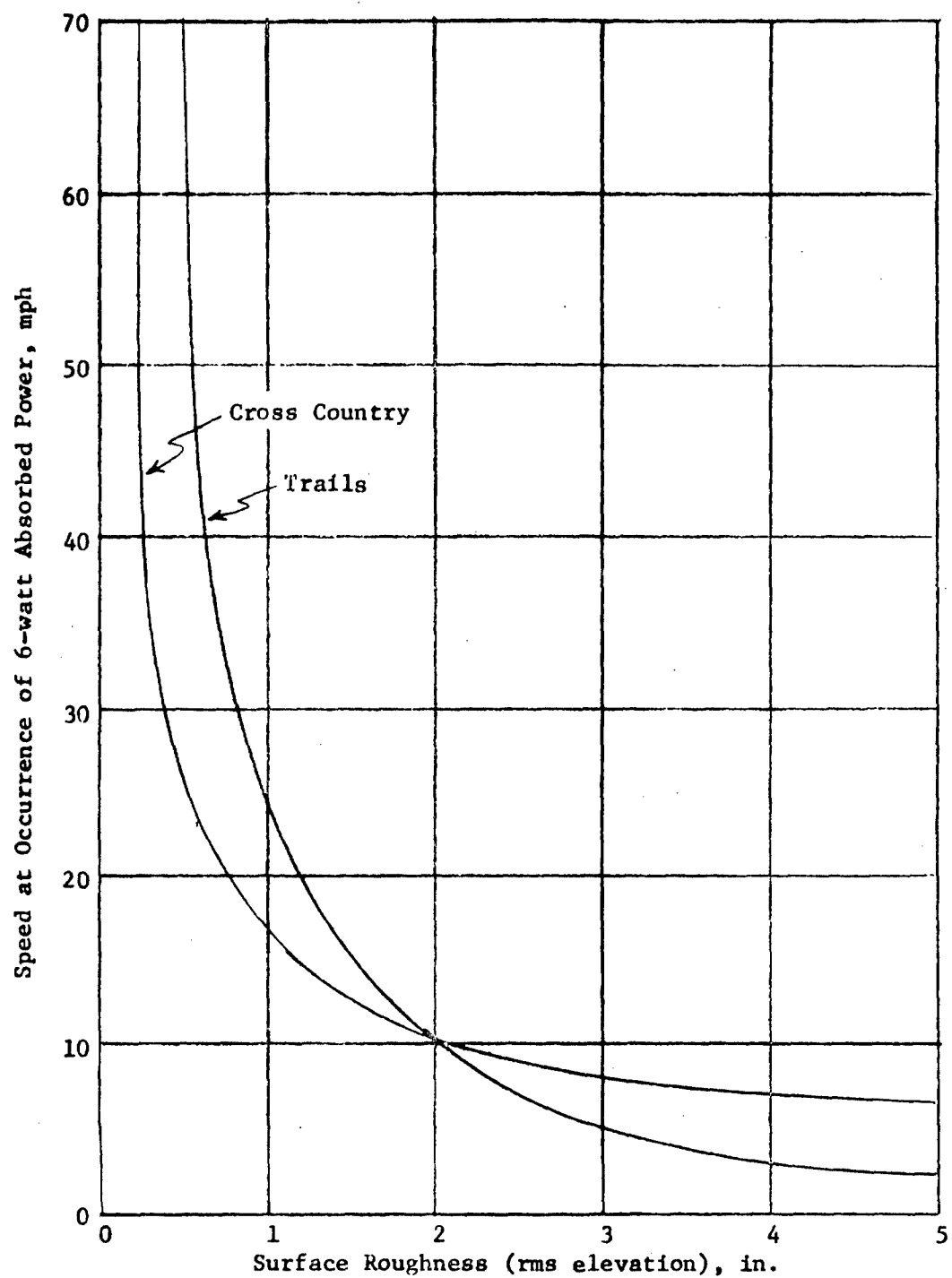


Figure C18. Ride limiting speed-surface roughness relations for M35A2

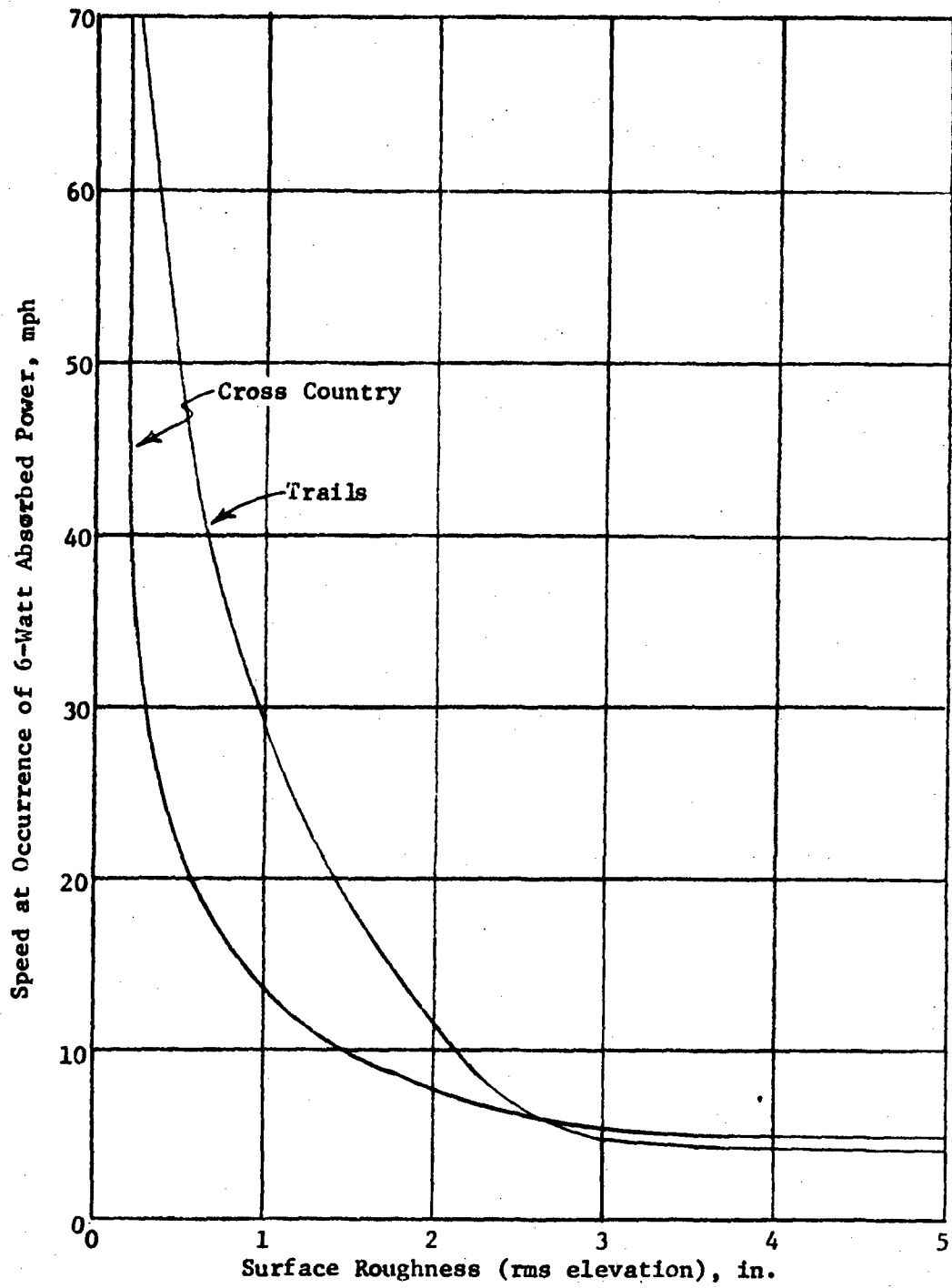


Figure C19. Ride limiting speed-surface roughness relations for M813

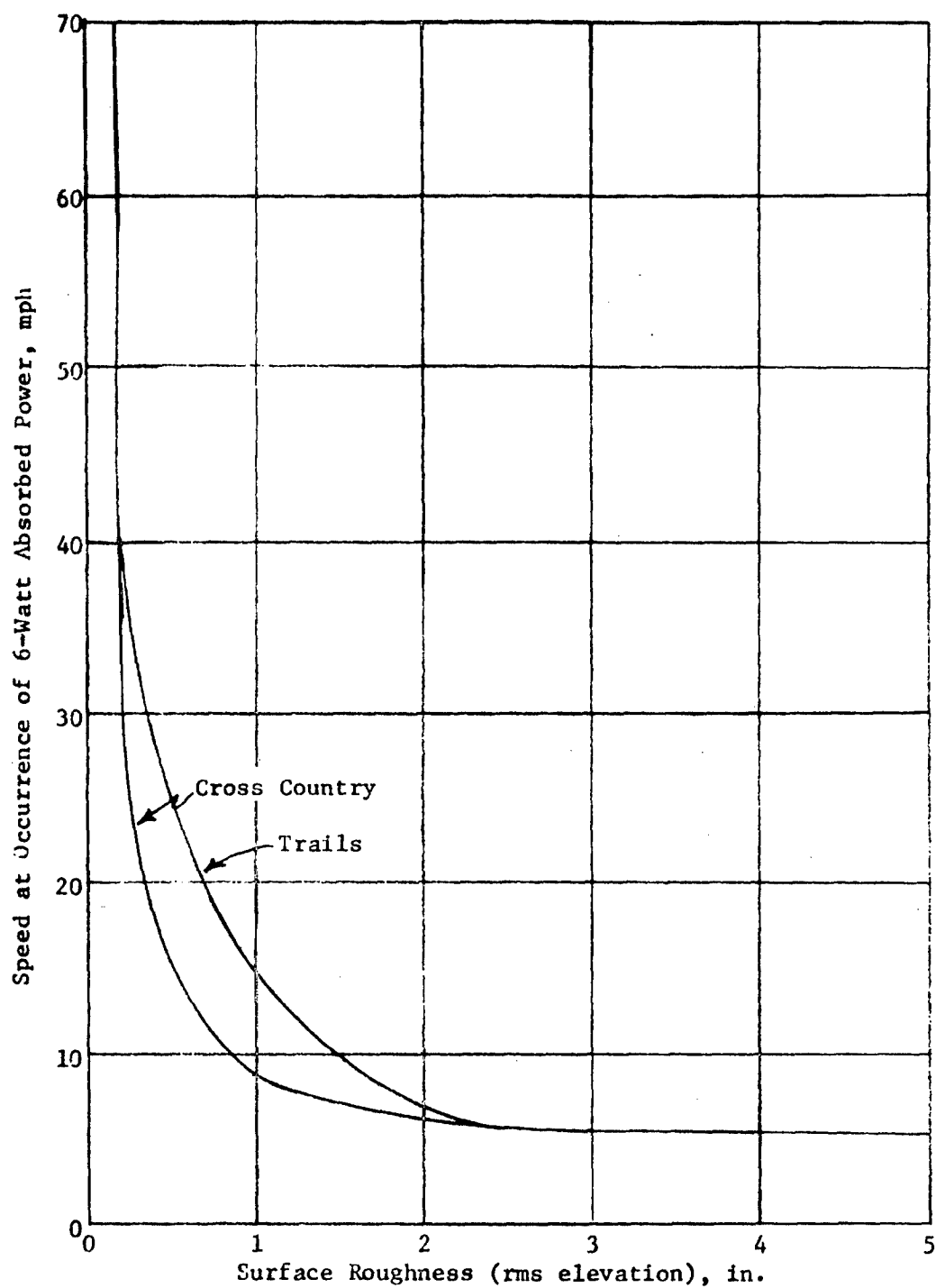


Figure C20. Ride limiting speed-surface roughness relations for M520E1

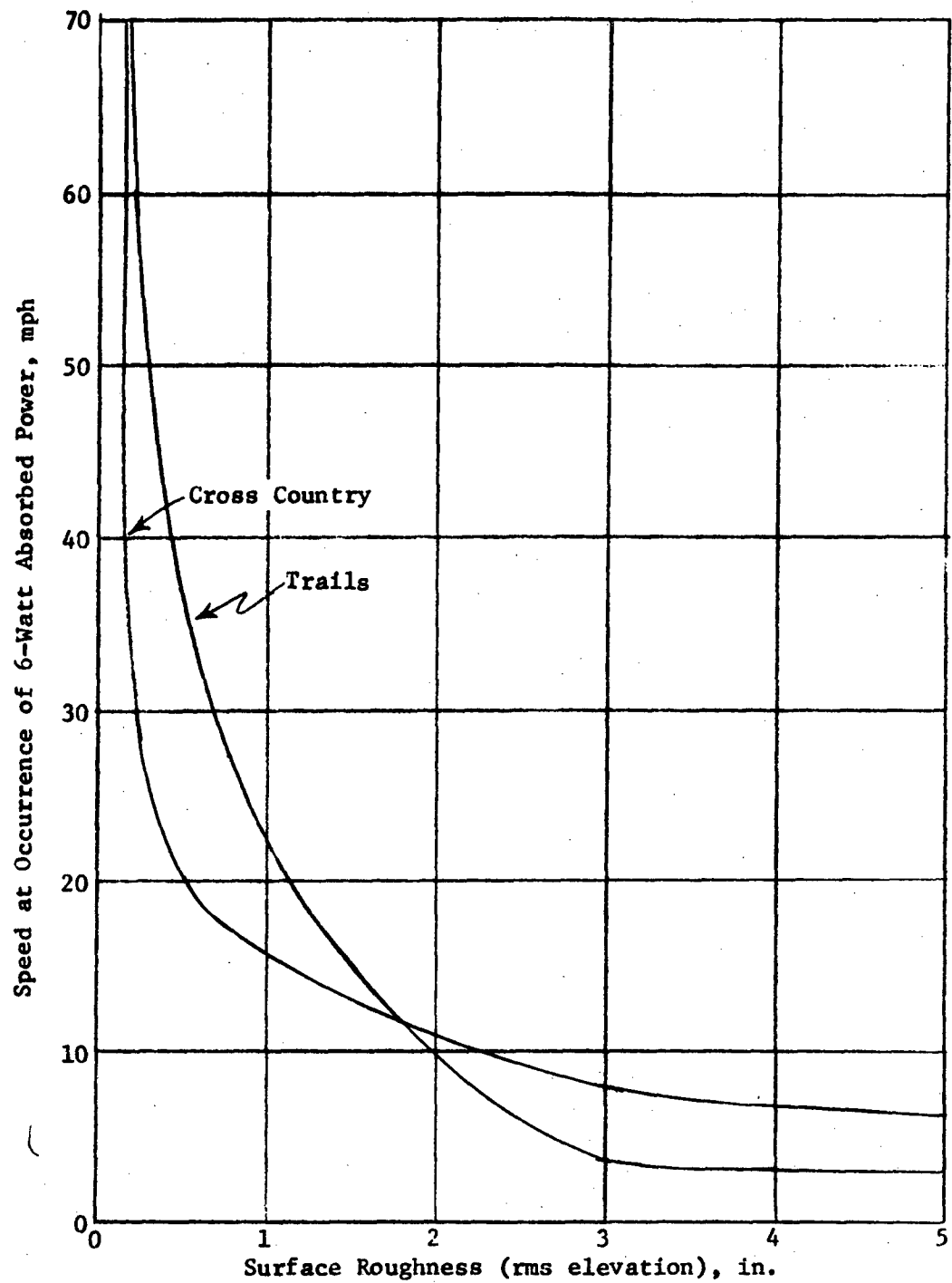


Figure C21. Ride limiting speed-surface roughness relations for M561

cross-country and trail courses, or other such surfaces conditioned by repetitive vehicular traffic, has revealed that trail courses generally permit higher speeds for corresponding levels of ride and surface roughness. Repetitive vehicular traffic on trails, particularly that of heavy track-laying vehicles, tends to smooth out the high-frequency components in the terrain surface, which excite the vehicle suspensions in their sensitive frequency regions and constitute a large portion of the vibrational energy transmitted to the vehicle's main frame. The relations chosen by the Army Mobility Model in mobility predictions depend on the type of surface over which the vehicle is traveling. A complete listing of the ride relations for the various configurations considered in this study are listed for cross-country, and roads and trails, respectively in Table B5-B6 of Appendix B. The ride data collected during this study are listed for each vehicle on each course tested in Table C1. The side-to-side, fore-to-aft, and total absorbed power are listed also.

25. Since these tests confirmed there were no significant influences on ride quality due to the towed loads, the ride relations established for the prime movers from the large bank of existing data were used in this study because they represent a broader range of terrain conditions.

Shock tests

26. The shock tests were limited by the inability of both the M102 and the XM198 to cross the obstacles without damage. The data collected are listed in Table C2. These data indicate only the number of peak accelerations falling within six selected intervals ranging from 1 to 4 g. Only rarely was the 2.5-g shock limit reached because the speeds were limited by the towed artillery. These data are not sufficient to draw any reliable conclusions concerning shock responses. Consequently, the shock relations characterized for the prime movers from previous data bases were used in this study. Shock responses for the self-propelled artillery were judiciously determined from existing shock relations of similar vehicles. The relations used in this study are listed in Table B4.

27. Tire and rim damage were predominant problems with the towed artillery. Over the rough cross-country and trail courses their severe motion limited speeds to not more than 15 mph. These limits were not considered in the mobility predictions, but it is suggested that more testing should be considered to develop relations for these limits in terms of speed and surface roughness.

Table C1
Ride Data

Course No.	Test No.	Roughness rms	Speed mph	Average Absorbed Power, watts			Total Average Absorbed Power, watts
				Vertical	Side- to-Side	Fore- to-Aft	
<u>M35A2-XM198</u>							
CC-2	0104	1.74	8.8	5.8	3.3	3.8	12.9
	0105		20.8	14.0	3.9	6.9	24.8
	0106		13.8	16.1	6.7	11.3	34.1
	0107		12.9	11.7	5.2	7.5	24.4
	0108		14.5	19.9	4.8	13.7	38.4
	0109		4.8	1.8	2.9	1.6	6.3
CC-3	0001	0.92	*	*	*	*	*
	0002		10.2	6.7	4.5	3.1	14.3
	0003		8.2	3.6	4.5	1.9	10.0
	0004		14.3	10.1	3.6	4.5	18.2
	0005		*	*	*	*	*
	0006		4.8	0.8	2.0	0.7	3.5
	0007		19.5	10.3	7.6	5.4	23.3
	0008		6.3	2.7	2.9	2.6	8.2
	0009		21.1	12.7	7.6	7.0	27.3
	0010		10.8	6.5	4.1	2.8	13.4
	0011		20.9	12.2	5.5	6.4	24.3
	0012		11.8	6.6	3.3	2.6	12.5
	0013		18.3	9.9	6.4	4.8	21.1
	0014		*	*	*	*	*
	0015		*	*	*	*	*
CC-4	0115	0.69	14.6	4.8	1.7	2.5	9.0
	0116		10.7	3.9	1.5	2.0	7.4
	0117		8.7	2.7	1.3	1.8	5.8
	0118		20.4	6.3	2.1	7.8	16.2
	0119		7.0	2.0	1.2	1.5	4.7
	0120		4.9	0.9	1.1	0.7	2.7
CC-5	0090	0.87	8.9	3.6	1.4	2.4	7.4
	0091		7.5	3.8	2.3	2.8	8.9
	0092		15.0	5.0	2.2	2.9	10.1
	0093		4.8	1.7	2.1	1.4	5.2
	0094		15.9	5.0	2.2	4.0	11.2
	0095		21.1	9.0	2.8	5.5	17.3

* Data voided on these tests.

(Sheet 1 of 16)

C38

Table C1 (Continued)

Course No.	Test No.	Roughness rms	Speed mph	Average Absorbed Power, watts			Total Average Absorbed Power, watts
				Vertical	Side to-Side	Fore- to-Aft	
<u>M35A2-XM198 (Continued)</u>							
CC-6	0096	1.29	14.5	14.5	6.2	9.2	29.9
	0097		*	*	*	*	
	0098		16.4	16.9	6.6	13.0	36.5
	0099		10.5	11.3	5.3	5.9	22.5
	0100		14.4	13.9	6.1	9.9	29.9
	0101		8.4	7.7	3.9	4.9	16.5
	0102		4.8	2.4	2.8	2.0	7.2
	0103		7.6	5.2	3.7	3.1	12.0
T-1	0078	1.24	8.7	1.9	5.6	1.4	8.9
	0079		12.6	6.0	6.4	5.6	18.0
	0080		*	*	*	*	*
	0081		10.5	4.1	6.0	2.5	12.6
	0082		15.2	15.7	7.3	16.5	39.5
	0083		12.4	6.1	6.2	5.0	17.3
T-2	0072	0.51	20.9	4.9	1.2	2.1	8.2
	0073		24.6	4.9	2.0	2.8	9.7
	0074		14.8	3.7	1.2	1.5	6.4
	0075		30.1	4.6	1.5	1.9	8.0
	0076		10.8	2.4	1.0	1.3	4.7
	0077		8.9	2.1	0.6	0.7	3.4
T-3	0066	1.01	8.7	1.9	2.1	1.1	5.1
	0067		14.8	6.6	4.3	5.2	16.1
	0068		12.1	3.3	3.3	2.0	8.6
	0069		14.7	6.7	4.7	4.7	16.1
	0070		21.5	15.8	5.1	21.8	42.7
	0071		17.8	9.1	4.7	19.3	33.1
T-4	0084	1.44	8.7	4.2	2.2	3.0	9.4
	0085		16.2	6.3	4.0	8.6	18.9
	0086		20.5	15.5	3.3	14.5	33.3
	0087		4.8	0.7	1.9	1.2	3.8
	0088		14.4	8.6	4.3	6.4	19.3
	0089		6.5	2.0	2.0	2.0	6.0

(Continued)

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C39

Table C1 (Continued)

Course No.	Test No.	Roughness rms	Speed mph	Average Absorbed Power, watts			Total Average Absorbed Power, watts
				Vertical	Side to-Side	Fore- to-Aft	
<u>M35A2-XM198 (Continued)</u>							
SR-1	0110	0.09	33.3	0.6	0.0	0.0	0.6
	0111		21.5	0.9	0.0	0.3	1.2
	0112		37.9	0.6	0.1	0.0	0.7
	0113		17.7	0.8	0.0	0.1	0.9
	0114		10.7	0.4	0.0	0.0	0.4
<u>M35A2-M102</u>							
CC-2	0025	1.74	*	*	*	*	*
	0026		4.7	2.9	3.5	1.6	8.0
	0027		8.7	7.0	4.2	3.5	14.7
	0028		10.4	7.4	3.8	2.9	14.1
	0029		14.7	18.7	4.7	7.6	31.0
	0030		12.6	10.0	3.6	3.7	17.3
	0031		12.0	8.9	3.2	3.3	15.4
	0032		7.1	4.3	3.6	2.6	10.5
	0033		14.7	18.8	4.9	7.0	30.7
CC-3	0016	0.92	12.5	6.6	3.7	1.8	12.1
	0017		8.5	4.0	3.9	1.7	9.6
	0018		16.5	10.0	6.2	4.0	20.2
	0019		4.7	0.6	2.1	0.3	3.0
	0020		20.5	12.3	6.3	3.9	22.5
	0021		6.0	1.1	2.7	0.4	4.2
	0022		24.1	13.8	3.5	3.5	20.8
	0023		10.2	5.5	3.8	1.8	11.1
	0024		24.4	13.9	3.2	3.6	20.7
CC-4	0146	0.69	14.5	3.6	1.4	1.1	6.1
	0147		21.0	5.1	2.8	2.4	10.3
	0148		21.8	6.6	1.9	3.0	11.5
	0149		24.4	5.3	2.2	2.5	10.0
	0150		11.2	2.9	1.1	1.1	5.1
	0151		18.1	5.0	2.3	2.6	9.9
CC-5	0047	0.87	*	*	*	*	*
	0048		8.7	4.1	2.6	1.7	8.4
	0049		15.2	6.2	1.3	1.8	9.3
	0050		12.1	6.4	1.4	2.1	9.9
	0051		12.9	5.1	1.3	1.4	7.8

(Continued)

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C40

Table C1 (Continued)

Course No.	Test No.	Roughness rms	Speed mph	Average Absorbed Power, watts			Total Average Absorbed Power, watts
				Vertical	Side to-Side	Fore- to-Aft	
M35A2-M102 (Continued)							
CC-5	0052	0.87	17.3	6.1	1.5	2.3	9.9
	0053		4.8	1.7	2.3	1.1	5.1
CC-6	0034	1.24	4.8	2.8	3.1	1.6	7.5
	0035		8.4	9.5	5.0	2.6	17.1
	0036		10.8	7.8	4.1	2.5	14.4
	0037		6.5	4.7	3.5	2.1	10.3
	0038		14.5	13.4	4.9	5.5	23.8
	0039		12.2	14.6	4.3	4.3	23.2
	0040		10.1	8.3	-	-	-
	0041		-	-	-	-	-
	0042		-	-	-	-	-
	0043		13.1	11.7	5.2	4.4	21.3
	0044		9.8	7.1	4.5	2.7	14.3
	0045		-	-	-	-	-
T-1	0139	1.24	-	-	-	-	-
	0140		14.7	9.8	0.6	5.6	25.0
	0141		8.9	2.4	5.0	1.1	8.5
	0142		-	-	-	-	-
	0143		12.5	5.5	5.9	2.0	13.4
	0144		-	-	-	-	-
	0145		-	-	-	-	-
T-2	0060	0.51	14.9	1.8	0.7	0.3	2.8
	0061		-	-	-	-	-
	0062		24.1	4.6	2.4	1.8	8.8
	0063		31.0	3.3	1.5	0.9	5.7
	0064		19.5	4.6	1.9	2.1	8.6
	0065		27.3	4.1	1.9	1.6	7.6
T-3	0054	1.01	8.8	1.8	1.7	0.7	4.2
	0055		15.0	5.9	2.9	2.1	10.9
	0056		12.5	3.4	2.5	1.5	7.4
	0057		20.7	12.4	3.9	6.8	23.1
	0058		16.9	7.6	3.1	3.8	14.5
	0059		25.3	18.1	4.1	10.0	32.2
T-4	0133	1.44	15.0	9.0	6.1	4.5	19.6
	0134		8.9	3.7	2.4	3.0	9.1
	0135		-	-	-	-	-

(Continued)

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C41

Table C1 (Continued)

Course No.	Test No.	Roughness rms	Speed mph	Average Absorbed Power, watts			Total Average Absorbed Power, watts
				Vertical	Side to-Side	Fore- to-Aft	
M35A2-M102 (Continued)							
T-4	0136	1.44	6.6	2.3	2.4	2.2	6.9
	0137		19.8	11.2	4.2	6.3	21.7
	0138		12.4	7.0	3.3	3.6	13.9
SR-1	0152	0.09	31.0	0.3	0.0	0.0	0.3
	0153		42.0	0.2	0.0	0.0	0.2
	0154		21.1	0.4	0.0	0.0	0.4
	0155		15.2	0.3	0.0	0.0	0.3
M813							
CC-2	0254	1.74	12.0	8.9	5.4	3.6	17.9
	0255		15.9	17.4	5.3	6.0	28.7
	0256		12.7	8.0	4.8	2.9	15.7
	0257		7.8	7.0	5.2	3.0	15.2
	0258		9.2	6.4	4.7	3.4	14.5
	0259		4.9	2.7	4.7	1.0	8.4
	0260		7.2	4.8	3.7	2.3	10.8
	CC-3		0231	0.92	11.6	5.3	5.1
0232		6.4	1.7		4.1	0.7	6.5
0233		14.9	6.7		4.3	3.7	14.7
0234		17.5	13.2		7.7	6.2	27.1
0235		15.7	9.9		5.2	3.8	18.9
0236		8.2	6.4		5.6	2.6	14.6
0237		8.6	5.9		4.9	2.3	13.1
0238		3.5	0.2		2.6	0.4	3.2
0239		9.7	7.5		6.1	2.4	16.0
CC-4		0297	0.69		21.3	11.2	2.8
	0298	17.6		4.0	2.6	1.9	8.5
	0299	19.1		6.6	2.1	2.4	11.1
	0300	13.6		2.9	2.0	1.4	6.3
	0301	8.3		2.5	1.2	1.1	4.8
	0302	4.9		1.2	1.7	0.3	3.2
CC-5	0240	0.87	19.9	9.5	3.6	3.3	16.4
	0241		9.4	3.9	3.3	2.5	9.7
	0242		21.8	13.4	2.9	3.2	19.5

(Continued)

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(Sheet 5 of 16)

Table C1 (Continued)

Course No.	Test No.	Roughness rms	Speed mph	Average Absorbed Power, watts			Total Average Absorbed Power, watts
				Vertical	Side to-Side	Fore- to-Aft	
M813 (Continued)							
CC-5	0243	0.87	12.5	5.6	3.2	2.3	11.1
	0244		15.9	4.6	2.9	3.0	10.5
	0245		6.2	2.7	3.6	1.2	7.5
	0246		17.6	8.5	4.6	3.3	16.4
	0247		14.7	5.2	2.7	2.7	10.6
CC-6	0248	1.29	11.9	8.5	8.4	4.2	21.1
	0249		14.3	15.3	11.5	3.6	30.4
	0250		12.5	8.7	7.7	2.9	19.3
	0251		8.4	4.2	5.6	2.7	12.5
	0252		9.1	6.2	6.8	3.0	16.0
	0253		4.8	1.9	3.6	0.9	6.4
T-1	0269	1.24	10.1	5.5	8.5	2.4	16.4
	0270		12.4	6.4	9.6	2.5	18.5
	0271		-	-	-	-	-
	0272		-	-	-	-	-
	0273		15.3	20.4	11.6	5.6	38.6
	0274		12.8	7.7	10.5	2.2	20.4
	0275		7.1	1.5	7.3	0.8	9.6
	0276		8.1	1.9	8.6	1.7	12.2
	0277		12.2	8.1	9.6	2.4	20.1
T-2	0278	0.51	20.7	4.0	2.7	1.1	7.8
	0279		26.2	5.1	2.4	1.5	9.0
	0280		30.5	4.9	3.1	2.5	10.5
	0281		32.7	7.2	2.6	2.4	12.2
	0282		10.0	1.6	1.0	0.4	3.0
	0283		22.5	4.0	2.1	1.4	7.5
	0284		15.4	2.3	1.5	1.2	5.0
T-3	0285	1.01	21.1	23.2	7.1	6.8	37.1
	0286		18.4	18.9	5.9	3.2	28.0
	0287		14.8	7.8	3.7	2.6	14.1
	0288		15.5	5.3	3.2	1.7	10.2
	0289		12.5	4.5	3.4	1.5	9.4
	0290		6.2	0.7	1.8	0.3	2.8
	0291		9.1	2.4	2.1	1.0	5.5

(Continued)

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C43

Table C1 (Continued)

Course No.	Test No.	Roughness rms	Speed mph	Average Absorbed Power, watts			Total Average Absorbed Power, watts	
				Vertical	Side to-Side	Fore- to-Aft		
M813 (Continued)								
T-4	0261	1.44	5.7	1.1	3.8	0.5	5.4	
	0262		8.3	4.2	3.5	2.0	9.7	
	0263		10.1	7.6	5.1	2.5	15.2	
	0264		12.0	4.6	5.3	2.9	12.8	
	0265		11.8	6.9	6.7	3.2	16.8	
	0266		14.4	8.3	6.4	4.7	19.4	
	0267		17.8	18.1	5.0	5.9	29.0	
	0268		9.9	5.1	4.9	2.7	12.7	
SR-1	0292	0.09	44.0	0.2	0.2	0.2	0.6	
	0293		32.9	0.4	0.1	0.0	0.5	
	0294		23.9	0.9	0.1	0.0	1.0	
	0295		13.0	0.4	0.1	0.0	0.5	
	0296		18.8	0.8	0.0	0.1	0.9	
M813-XM198								
CC-2	0181	1.74	10.1	6.9	3.6	2.3	12.8	
	0182		6.9	5.4	4.5	1.9	11.8	
	0183		11.9	8.6	5.5	3.7	17.8	
	0184		13.2	11.9	5.9	4.3	12.1	
	0185		8.2	5.2	3.8	2.3	11.3	
	0186		5.0	2.3	3.8	0.8	6.9	
CC-3	0157	0.92	12.2	5.0	4.9	1.8	11.7	
	0158		7.2	4.5	3.7	1.2	9.4	
	0159		15.0	6.1	4.8	2.9	13.8	
	0160		{ duplicate test no.	4.9	0.9	3.5	0.4	4.8
	0160			21.8	9.8	6.8	4.6	21.8
	0161		7.1	5.1	4.3	1.2	10.6	
	0162		7.2	4.3	4.7	1.3	10.3	
	0163		9.4	8.9	5.7	2.1	16.7	
	0164		9.8	8.9	5.3	2.5	16.7	
	0165		11.8	7.2	6.3	2.2	15.7	
CC-4	0219	0.69	14.6	4.1	1.7	1.1	6.9	
	0220		20.4	6.2	2.5	3.0	11.7	
	0221		10.1	4.1	1.2	1.3	6.6	

(Continued)

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C44

Table C1 (Continued)

Course No.	Test No.	Roughness rms	Speed mph	Average Absorbed Power, watts			Total Average Absorbed Power, watts
				Vertical	Side-to-Side	Fore-to-Aft	
<u>M813-XM198 (Continued)</u>							
CC-4	0222	0.69	7.1	2.1	1.1	0.8	4.0
	0223		16.4	4.2	2.0	1.4	7.6
CC-5	0167	0.87	6.4	2.8	3.3	1.2	7.3
	0168		11.6	5.6	2.9	2.3	10.8
	0169		19.7	6.9	2.6	2.9	12.4
	0170		7.0	4.4	3.7	1.5	9.6
	0171		20.9	9.2	3.1	4.0	16.3
	0172		15.9	4.4	2.3	1.6	8.3
	0173		11.7	5.3	4.1	2.4	11.8
	0174		15.6	5.6	2.9	2.3	10.8
CC-6	0175	1.29	11.8	10.1	7.7	4.5	22.3
	0176		6.9	4.6	3.6	1.8	10.0
	0177		15.4	13.1	8.3	5.0	26.4
	0178		9.2	6.2	8.6	2.4	17.2
	0179		12.5	11.0	8.8	5.1	24.9
	0180		4.9	2.3	3.4	0.9	6.6
T-1	0196	1.24	9.2	2.3	8.7	1.1	12.1
	0197		12.6	5.6	10.7	2.3	18.6
	0198		15.4	11.9	14.1	6.2	32.2
	0199		12.3	7.7	11.4	4.2	23.3
	0200		-	-	-	-	-
	0201		13.0	7.6	10.3	2.1	20.0
	0202		15.3	17.0	12.8	3.6	33.4
T-2	0203	0.51	20.7	3.7	2.9	0.7	7.3
	0204		23.8	7.0	2.4	1.2	10.6
	0205		27.6	3.0	2.6	1.6	7.2
	0206		12.5	1.8	1.1	0.5	3.4
	0207		15.6	2.1	1.5	0.5	4.1
	0208		23.8	7.7	2.1	1.6	11.4
	0209		31.5	3.5	2.0	1.5	7.0
T-3	0210	1.01	19.5	17.3	5.6	9.1	32.0
	0211		6.2	0.8	1.6	0.3	2.7
	0212		11.7	3.4	3.2	1.1	7.7

(Continued)

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C45

Table C1 (Continued)

Course No.	Test No.	Roughness rms	Speed mph	Average Absorbed Power, watts			Total Average Absorbed Power, watts
				Vertical	Side- to-Side	Fore- to-Aft	
M813-XM198 (Continued)							
T-3	0213	1.01	14.9	6.7	4.1	2.2	13.0
	0214		18.1	11.9	5.3	5.0	22.2
T-4	0187	1.44	9.4	6.6	5.7	3.0	15.3
	0188		11.1	5.4	4.8	2.2	12.4
	0189		12.7	6.0	6.5	2.8	15.3
	0190		6.3	2.6	2.7	1.1	6.4
	0191		14.6	7.5	7.0	2.9	17.4
	0192		7.6	4.8	2.7	1.7	9.2
	0193		9.6	9.5	4.7	2.4	16.6
	0194		10.9	4.6	5.7	2.1	12.4
	0195		8.2	6.9	3.8	2.1	12.8
SR-1	0215	0.09	43.3	0.5	0.0	0.2	0.7
	0216		30.3	0.8	0.1	0.0	0.9
	0217		24.6	0.9	0.0	0.1	1.0
	0218		19.3	0.4	0.1	0.1	0.6
M520-XM198							
CC-2	0348	1.74	8.9	12.2	9.9	17.0	39.1
	0349		7.9	9.1	11.7	10.7	31.5
	0350		6.5	4.5	9.2	5.1	18.8
	0351		6.0	3.0	10.3	4.4	17.7
	0352		5.1	2.0	6.2	1.7	9.9
	0353		4.7	1.6	9.0	1.6	12.2
CC-3	0312	0.92	6.8	2.6	4.1	9.2	15.9
	0313		-	-	-	-	-
	0314		9.3	12.2	3.6	24.5	40.3
	0315		7.4	6.0	10.4	12.9	29.3
	0316		-	-	-	-	-
	0317		5.7	1.6	5.8	3.5	10.9
	0318		9.9	12.0	5.9	17.7	35.6
	0319		6.9	4.1	9.8	10.6	24.5
CC-4	0339	0.69	11.2	2.6	3.9	3.0	9.5
	0340		6.7	0.9	2.8	0.9	4.6
	0341		17.6	13.6	5.5	8.3	27.4

(Continued)

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CHP

Table C1 (Continued)

Course No.	Test No.	Roughness rms	Speed mph	Average Absorbed Power, watts			Total Average Absorbed Power watts
				Vertical	Side- to-Side	Fore- to-Aft	
M520-XM198 (Continued)							
CC-4	0342	0.69	13.8	8.1	4.7	9.8	22.6
	0343		11.2	2.9	3.2	3.5	9.6
CC-5	0321	0.87	4.7	1.5	5.3	2.3	9.1
	0322		7.0	3.8	3.9	6.4	14.1
	0323		5.9	3.0	5.0	5.1	13.1
	0324		-	-	-	-	-
	0325		9.9	12.1	5.7	22.0	39.8
	0326		-	-	-	-	-
	0327		8.0	5.8	5.3	9.6	20.7
CC-6	0328	1.29	6.7	5.3	-	-	-
	0329		6.3	3.8	12.2	6.5	22.5
	0330		6.5	5.1	-	-	-
	0331		10.2	10.9	-	-	-
	0332		6.8	4.6	-	-	-
	0333		10.2	8.9	-	-	-
CC-6	0344	1.29	10.5	14.0	14.3	14.9	43.2
	0345		8.9	5.2	9.4	8.4	23.0
	0346		10.1	11.0	13.5	9.4	33.9
	0347		5.6	1.6	8.7	1.6	11.9
T-1	0363	1.24	11.8	9.0	22.4	11.6	43.0
	0364		12.0	13.4	29.1	11.1	53.6
	0365		9.6	2.8	18.9	3.1	24.8
	0366		9.5	11.6	25.8	17.8	55.2
	0367		10.9	5.5	19.1	4.7	29.3
	0368		5.5	0.5	15.2	1.2	16.9
	0369		7.2	0.9	12.9	1.6	15.4
T-2	0371	0.51	10.8	1.4	1.9	1.8	5.1
	0372		13.3	9.6	3.8	22.5	35.9
	0373		12.0	4.0	2.2	5.7	11.9
	0374		15.6	7.5	3.5	5.4	16.4
	0375		14.3	6.2	3.0	11.2	20.4
	0376		17.0	6.5	4.1	4.2	14.8
	0377		17.3	7.4	4.2	5.4	17.0
	0378		20.9	9.8	4.3	11.9	26.0
	0379		24.6	11.9	8.0	21.0	40.9

(Continued)

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Table C1 (Continued)

Course No.	Test No.	Roughness rms	Speed mph	Average Absorbed Power, watts			Total Average Absorbed Power watts
				Vertical	Side- to-Side	Fore- to-Aft	
M520-XM198 (Continued)							
T-3	0380	1.01	15.6	38.2	18.5	12.1	68.8
	0381		11.1	4.9	6.6	7.4	18.9
	0382		12.3	9.7	7.7	23.3	40.7
	0383		9.9	4.9	6.6	3.3	14.8
	0384		13.8	54.3	34.5	21.7	110.5
	0385		6.5	0.6	4.6	0.9	6.1
	0386		6.9	1.7	4.7	1.8	8.2
T-4	0354	1.44	6.1	4.7	5.7	6.0	16.4
	0355		6.8	4.3	6.7	6.7	17.7
	0356		7.6	5.0	6.0	7.2	18.2
	0357		7.4	6.0	8.9	7.3	22.2
	0358		9.2	11.8	8.1	13.0	32.9
	0359		4.3	0.2	5.4	0.5	6.1
	0360		5.1	0.9	5.9	1.3	8.1
	0361		7.2	5.6	10.4	7.5	23.5
	0362		11.0	11.4	9.9	15.5	36.8
SR-1	0334	0.09	32.5	0.5	0.2	0.4	1.08
	0335		19.8	0.4	0.1	0.2	0.73
	0336		11.3	0.04	0.0	0.0	0.04
	0337		22.73	0.7	0.2	2.6	3.46
	0338		25.98	0.5	0.1	0.3	0.88
CC-2	**	M561-M102					
CC-3	0408	0.92	7.4	0.9	0.3	2.6	3.8
	0409		11.3	3.5	1.5	6.5	11.5
	0410		15.0	4.1	1.4	1.9	7.4
	0411		16.6	8.1	1.4	3.5	13.0
	0412		17.1	6.0	2.4	3.0	11.4
	0413		10.5	3.3	2.8	4.8	10.9
	0414		8.3	1.7	2.3	3.8	7.8
CC-4	**						

(Continued)

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(Sheet 11 of 16)

Table C1 (Continued)

Course No.	Test No.	Roughness rms	Speed mph	Average Absorbed Power, watts			Total Average Absorbed Power watts
				Vertical	Side-to-Side	Fore-to-Aft	
M561-M102 (Continued)							
CC-5	0415		8.5	2.6	1.9	3.5	8.0
	0416		12.1	4.3	1.0	4.9	10.2
	0417		16.8	6.2	0.7	3.9	10.8
	0418		6.3	1.5	1.8	2.1	5.4
	0419		9.9	3.0	1.4	4.0	8.4
	0420		3.7	0.5	1.4	0.8	2.7
CC-6	0421		8.2	3.0	2.9	5.6	11.5
	0422		4.9	1.5	1.5	2.6	5.6
	0423		12.2	7.4	3.6	9.2	20.2
	0424		9.0	4.5	2.7	4.4	11.6
T-1	0398		8.3	0.9	3.4	3.7	8.0
	0399		12.0	3.7	2.5	7.9	14.1
	0400		16.4	6.6	3.1	5.4	15.1
	0401		11.9	3.2	2.2	7.6	13.0
	0402		10.0	1.7	4.2	4.7	10.6
T-2	0393		19.1	2.1	0.7	2.1	4.9
	0394		32.0	3.0	0.5	2.2	5.7
	0395		16.0	1.6	0.6	1.2	3.4
	0396		26.2	2.8	0.9	4.1	7.8
	0397		8.4	0.0	0.2	0.5	0.7
T-3	0387		8.5	0.5	1.3	2.0	3.8
	0388		16.5	4.8	1.4	4.0	10.2
	0389		12.5	2.1	1.3	3.7	7.1
	0390		21.8	9.5	2.6	7.1	19.2
	0391		16.5	4.0	2.3	3.1	9.4
	0392		19.7	7.7	2.1	6.1	15.9
T-4	0403		8.4	1.8	3.4	3.8	9.0
	0404		10.6	3.9	2.1	8.0	14.0
	0405		12.5	3.6	3.0	2.1	8.7
	0406		14.8	6.5	2.1	6.0	14.6
	0407		6.5	0.5	1.7	1.7	3.9

(Continued)

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(Sheet 12 of 16)

Table C1 (Continued)

Course No.	Test No.	Roughness rms	Speed mph	Average Absorbed Power, watts			Total Average Absorbed Power, watts
				Vertical	Side- to-Side	Fore- to-Aft	
M109A1							
CC-2	0486	1.74	14.1	4.2	1.3	1.9	7.4
	0487		15.0	4.2	1.8	2.8	8.8
	0488		18.8	5.9	2.3	0.8	9.0
	0489		15.2	3.7	1.9	0.6	6.2
	0490		7.6	2.4	0.9	2.0	5.3
	0491		10.4	2.9	1.3	0.4	4.6
CC-3	0466	0.92	10.6	1.0	0.3	0.2	1.5
	0467		14.0	2.5	1.3	0.7	4.5
	0468		21.1	2.7	0.2	0.6	3.5
	0469		18.6	3.5	0.8	0.4	4.7
	0470		22.7	2.6	1.1	0.2	3.9
	0471		6.6	0.6	0.5	0.3	1.4
CC-4	0430	0.69	6.2	0.7	0.1	0.3	1.1
	0431		11.2	1.4	0.2	0.1	1.7
	0432		18.4	2.0	0.3	0.4	2.7
	0433		21.5	3.3	0.9	0.2	4.4
	0434		20.4	1.6	0.1	0.0	1.7
	0435		22.2	2.5	0.3	0.0	2.8
	0436		16.7	1.5	0.2	0.2	1.9
	0437		22.5	2.2	0.7	0.1	3.0
CC-5	0472	0.87	6.0	3.3	0.8	1.9	6.0
	0473		9.0	3.6	0.6	0.3	4.5
	0474		15.9	3.7	1.1	0.9	5.7
	0475		5.4	2.2	0.6	1.8	4.6
	0476		21.3	3.6	1.6	0.8	6.0
	0477		12.0	3.4	0.8	0.5	4.7
	0478		15.4	2.9	0.9	0.6	4.4
	0479		6.4	2.5	0.6	1.6	4.7
CC-6	0480	1.29	14.0	3.6	1.5	1.2	6.3
	0481		12.8	4.2	1.7	1.2	7.1
	0482		18.6	4.5	2.1	1.0	7.6
	0483		10.0	4.7	1.9	0.5	7.1
	0484		18.3	4.7	1.3	0.2	6.2
	0485		6.1	2.9	0.9	3.3	7.1

(Continued)

csp (Sheet 13 of 16)

Table C1 (Continued)

Course No.	Test No.	Roughness rms	Speed mph	Average Absorbed Power, watts			Total Average Absorbed Power, watts
				Vertical	Side- to-Side	Fore- to-Aft	
M109A1 (Continued)							
T-1	0452	1.24	6.3	0.4	0.6	0.4	1.4
	0453		*	*	*	*	*
	0454		16.1	2.5	2.6	0.2	5.3
	0455		23.0	3.3	6.1	0.4	9.8
	0456		14.9	1.8	2.2	0.9	4.9
	0457		22.7	2.9	8.7	0.4	12.0
	0458		12.4	1.8	2.0	0.5	4.3
	T-2		0445	0.51	13.5	0.5	0.0
0446		19.5	1.7		0.5	0.3	2.5
0447		21.3	1.2		0.2	0.0	1.4
0448		27.3	1.9		0.4	0.1	2.4
0449		21.1	1.2		0.3	0.0	1.5
0450		26.9	1.4		0.4	0.0	1.8
0451		11.3	1.1		0.2	0.0	1.3
T-3		0438	1.01		6.9	0.2	0.0
	0439	13.3		1.4	0.7	0.3	2.4
	0440	20.9		2.3	1.6	0.0	3.9
	0441	23.5		4.4	1.5	0.3	6.2
	0442	17.2		3.1	0.8	0.8	4.7
	0443	23.0		4.7	1.2	0.2	6.1
	0444	21.8		3.6	1.5	0.0	5.1
	T-4	0459		1.44	8.5	1.6	0.5
0460		15.1	5.2		0.8	1.5	7.5
0461		15.1	6.2		0.5	2.7	9.4
0462		18.9	8.9		0.7	4.7	14.3
0463		12.0	3.6		0.6	1.1	5.3
0464		16.2	6.4		1.2	1.9	9.5
0465		6.5	0.8		0.3	0.5	1.6
SR-1		0426	0.09		24.6	0.1	0.0
	0427	17.8		0.2	0.0	0.1	0.3
	0428	13.1		0.3	0.1	0.1	0.5
	0429	5.1		0.0	0.1	0.1	0.2
	M110E2						
CC-2	0504	1.74	5.0	1.5	1.4	2.3	5.2
	0505		8.0	1.5	0.9	0.8	3.2
	0506		8.6	1.8	1.3	0.9	4.0

(Continued)

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Table C1 (Continued)

Course No.	Test No.	Roughness rms	Speed mph	Average Absorbed Power, watts			Total Average Absorbed Power, watts
				Vertical	Side- to-Side	Fore- to-Aft	
M110E2 (Continued)							
CC-2	0528	1.74	5.5	1.5	1.5	1.8	4.8
	0529		9.2	3.0	1.6	2.0	6.6
	0530		18.7	9.9	3.8	1.9	15.6
	0531		14.6	3.7	2.2	1.8	7.7
	0532		16.2	4.0	2.6	2.3	8.9
	0533		16.2	5.1	2.1	0.7	7.9
CC-3	0492	0.92	5.4	0.1	0.3	0.2	0.6
	0493		8.2	0.2	0.2	0.2	0.6
	0494		14.3	0.7	0.6	0.3	1.6
	0495		14.8	0.9	0.5	0.0	1.4
	0496		16.5	0.7	0.4	0.2	1.3
	0497		11.8	0.2	0.1	0.0	0.3
	0498		17.0	0.8	0.5	0.3	1.6
CC-4	No data	0.69					
CC-5†	0492	0.87	9.2	1.4	0.5	0.4	2.3
	0493		5.3	1.3	1.0	1.6	3.9
	0494		15.3	1.6	1.0	0.7	3.3
	0495		5.4	0.8	0.7	1.0	2.5
	0496		20.1	1.9	0.9	0.1	2.9
CC-6	0499	1.29	5.5	1.2	1.7	1.7	4.6
	0500		9.0	1.5	1.1	1.0	3.6
	0501		15.3	1.8	1.1	0.7	3.6
	0502		12.0	1.9	1.5	0.6	4.0
	0503		17.5	2.2	2.1	0.9	5.2
	0534 (no test)						
T-1	0518	1.24	5.8	0.3	0.9	0.5	1.7
	0519		15.7	2.1	3.4	1.1	6.6
	0520		9.4	1.1	2.7	0.9	4.7
	0521		18.9	4.5	3.7	1.0	9.2
	0522		22.5	4.4	5.1	1.0	10.5

(Continued)

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(Sheet 15 of 16)

Table C1 (Concluded)

Course No.	Test No.	Roughness rms	Speed mph	Average Absorbed Power, watts			Total Average Absorbed Power, watts
				Vertical	Side- to-Side	Fore- to-Aft	
M110E2 (Continued)							
T-2	0514	0.51	6.0	0.1	0.0	0.0	0.1
	0515		25.6	1.2	1.0	0.1	2.3
	0516		15.6	0.8	0.3	0.3	1.4
	0517		20.9	1.1	0.3	0.1	1.5
T-3	0508		4.7	0.2	0.0	0.1	0.3
	0509		7.9	0.3	0.3	0.5	1.1
	0510		15.2	2.0	0.9	0.9	3.8
	0511		19.5	2.9	1.1	0.7	4.7
	0512		18.9	2.8	0.9	0.5	4.2
	0513		24.1	5.6	1.9	1.3	8.8
T-4	0523		6.0	1.2	1.0	1.0	4.0
	0524		9.5	1.8	1.1	1.4	4.3
	0525		15.2	4.5	0.8	1.9	7.2
	0526		17.8	5.1	2.7	0.9	8.7
	0527		21.6	11.3	1.1	1.9	14.3

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Table C2
Obstacle Height-Speed Data

Test No.	Obstacle Height, in.	Time sec	Speed mph	No. of Occurrences Peak Acceleration Levels, g					
				<u>>1<1.5</u>	<u>>1.5<2.0</u>	<u>>2.0<2.5</u>	<u>>2.5<3</u>	<u>>3<4</u>	<u>>4</u>
<u>M35A2-XM198</u>									
121	6	14.9		1	0	0	0	0	0
122	6	14.2		1	0	0	0	0	0
123	6	8.2		2	0	0	0	0	0
124	6	6.2		2	1	0	0	0	0
125	8	14.3		0	1	0	0	0	0
126	8	11.2		2	2	0	0	0	0
127	8	8.0		2	2	1	0	0	0
128	8	6.1		3	2	0	0	0	0
129	8	5.4		2	0	1	0	0	0
130	12	14.3		3	0	1	0	0	0
131	12	11.2		6	0	1	0	0	0
132	12	9.1		2	3	1	0	0	0
<u>M35A2-M102</u>									
156	6	14.4		1	0	0	0	0	0
(bent rims on M102)									
<u>M813-XM198</u>									
224	12	19.4	3.5	3	0	0	0	0	0
225	12	11.8	5.8	1	5	2	2	0	0
226	8	11.8	5.8	6	0	1	0	0	0
227	8	9.6	7.1	5	1	2	0	0	0
228	8	7.5	9.1	3	5	0	0	0	0
229	8	5.5	12.4	5	3	1	1	0	0
230	8	4.7	14.5	3	4	0	1	1	0
<u>M813</u>									
303	12	13.0	5.2	7	0	2	0	0	0
304	8	6.3	10.8	3	0	2	0	0	0
305	8	4.9	13.9	3	2	0	2	0	0
306	8	6.1	11.2	1	4	0	1	0	0
307	6	2.3	29.7	4	0	0	1	0	0
308	6	2.2	31.0	4	0	1	1	0	0
309	6	2.5	27.3	2	1	2	1	0	0
310	6	2.7	25.3	3	0	1	1	0	0
311	6	2.8	24.4	1	0	1	0	0	0
(Continued)									
(Sheet 1 of 2)									

(Continued)

(Sheet 1 of 2)

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Table C2. (Concluded)

Test No.	Obstacle Height, in.	Time sec	Speed mph	No. of Occurrences Peak Acceleration Levels, g					
				<u>>1≤1.5</u>	<u>>1.5≤2.0</u>	<u>>2.0≤2.5</u>	<u>>2.5≤3</u>	<u>>3≤4</u>	<u>>4</u>
<u>M109A1</u>									
492	6	10.0	6.8	0	0	0	0	0	0
493	6	5.1	13.4	0	0	0	0	0	0
494	6	2.9	23.5	2	0	0	0	0	0
495	6	2.7	25.2	0	0	0	0	0	0
496	8	9.6	7.1	0	0	0	0	0	0
497	8	5.3	12.9	0	0	0	0	0	0
498	8	3.5	19.5	0	0	0	0	0	0
499	8	2.7	25.2	0	0	0	0	0	0
500	8	2.7	25.2	2	0	0	0	0	0
501	12	10.0	6.8	0	0	0	0	0	0
502	12	5.5	12.4	1	0	1	0	0	0
503	12	5.4	12.6	3	0	0	0	0	0
<u>M110E2</u>									
534	6	7.3	9.3	0	0	0	0	0	0
535	6	3.7	18.4	0	0	0	0	1	0
536	6	4.2	16.2	0	0	0	0	0	0
537	8	11.9	5.7	0	0	0	0	0	0
538	8	7.4	9.2	0	0	0	0	0	0
539	8	4.7	14.5	0	0	0	1	0	0
540	12	8.5	8.0	1	0	0	0	0	0
541	12	7.5	9.1	1	0	0	0	0	0
542	12	4.8	14.2	1	0	0	0	0	0

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APPENDIX D: GENERALIZED TERRAIN DATA

1. Generalized terrain data were available for nine countries, referred to as countries A, B, C, D, E, F, G, H, and I. These data were prepared from limited available information and maps with scales ranging between 1:325,000 and 1:3,200,000. Principally because of the small scales of the maps, only type of surface material, soil strength (CI), slope, obstacle height, and vegetation diameter and spacing data were used to describe these nine study areas.

2. The terrain factors and classes used are given in Table D1. Terrain maps of these study areas are available at the U. S. Army Engineer Waterways Experiment Station. Legends describing the terrain units, terrain factor class numbers, and percentages of area occupied by the terrain units are given in Table D2 through D10.

Table D1

Terrain Factors and Classes Used in Describing Terrain or Map Units

1. Surface Composition

<u>Soil or Snow Strength, Cone Index (CI)</u>			<u>Value Used in Prediction, CI</u>
<u>Unit</u>	<u>Surface Material*</u>	<u>Class Range, CI</u>	
1	Fine-grained soil	>150	150
2	Fine-grained soil	75-150	112
3	Fine-grained soil	45-75	60
4	Fine-grained soil	>45	22
5	Coarse-grained soil	<150	150

2. Slope

<u>Unit</u>	<u>Class Range, %</u>	<u>Value Used in Prediction, %</u>
1	0-10	5
2	10-30	20
3	>30	30

3. Surface Geometry

<u>Height of Vertical Obstacle, in.</u>		
<u>Unit</u>	<u>Class Range, in.</u>	<u>Value Used in Prediction, in.</u>
1	<3.9	4
2	3.9-9.8	7
3	9.8-39.4	24
4	>39.4	39

* For country D, fine-grained and coarse-grained soil-vehicle relations were used.

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Table D1 (Continued)

4. Vegetation

Tropical Climate

Unit											
1		2		3		4		5		6	
1*	2**	1	2	1	2	1	2	1	2	1	2
1.0	1000	1.0	4	1.0	4	1.0	3	1.0	2	1.0	2
2.0	1000	2.0	9	2.0	10	2.0	6	2.0	4	2.0	2
3.0	1000	3.0	14	3.0	14	3.0	9	3.0	6	3.0	3
4.0	1000	4.0	20	4.0	17	4.0	12	4.0	8	4.0	4
5.0	1000	5.0	26	5.0	20	5.0	15	5.0	10	5.0	5
7.5	1000	7.5	42	7.5	27	7.5	21	7.5	16	7.5	10
10.0	1000	10.0	47	10.0	32	10.0	28	10.0	23	10.0	17

Temperate Climate

Unit											
1		2		3		4		5		6	
1	2	1	2	1	2	1	2	1	2	1	2
1.0	1000	1.0	11	1.0	10	1.0	8	1.0	6	1.0	4
2.0	1000	2.0	15	2.0	11	2.0	9	2.0	7	2.0	4
3.0	1000	3.0	20	3.0	13	3.0	10	3.0	7	3.0	5
4.0	1000	4.0	26	4.0	15	4.0	12	4.0	8	4.0	6
5.0	1000	5.0	29	5.0	16	5.0	13	5.0	10	5.0	6
7.5	1000	7.5	31	7.5	22	7.5	19	7.5	15	7.5	10
10.0	1000	10.0	33	10.0	30	10.0	26	10.0	22	10.0	19

Arid Climate

Unit											
1		2		3		4		5		6	
1	2	1	2	1	2	1	2	1	2	1	2
1.0	1000	1.0	13	1.0	7	1.0	6	1.0	5	1.0	4
2.0	1000	2.0	19	2.0	11	2.0	7	2.0	5	2.0	5
3.0	1000	3.0	24	3.0	15	3.0	8	3.0	6	3.0	5
4.0	1000	4.0	29	4.0	19	4.0	11	4.0	7	4.0	6
5.0	1000	5.0	34	5.0	22	5.0	14	5.0	10	5.0	7
7.5	1000	7.5	40	7.5	29	7.5	25	7.5	18	7.5	12
10.0	1000	10.0	43	10.0	36	10.0	33	10.0	27	10.0	20

(Continued)

- * Stem diameter \geq , in.
 ** Stem spacing \geq , ft.

D3

Table D1 (Concluded)

Example:

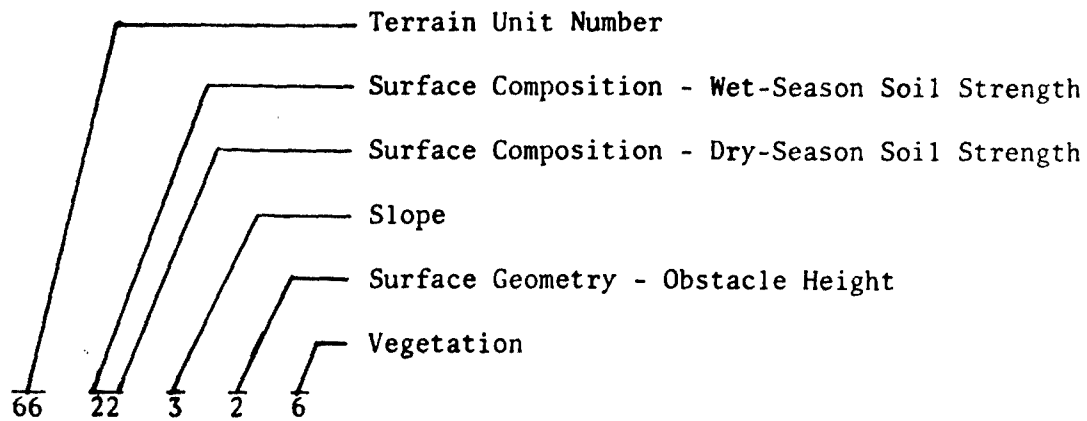


Table D2
Terrain Description and Percentage of Area Occupied by Each Terrain Unit in Country A

COUNTRY A												
TERRAIN FACTOR CLASS												
TERRAIN UNIT	CONF INDEX MEY	SLOPE	OBSTACLE HEIGHT	VEGETATION DENSITY	AREA PERCENT	TERRAIN UNIT	CONF INDEX MEY	SLOPE	OBSTACLE HEIGHT	VEGETATION DENSITY	AREA PERCENT	
3	1	1	1	3	0.03	218	4	1	1	1	0.00	
5	1	1	1	4	0.03	221	4	1	1	2	2.75	
6	1	1	1	5	0.05	225	4	1	1	2	0.48	
14	1	1	1	2	0.00	238	4	1	1	1	0.03	
16	1	1	1	3	0.03	231	4	1	2	2	0.03	
17	1	1	1	4	1.22	233	4	1	2	2	0.68	
18	1	1	1	5	0.07	234	4	1	2	2	0.21	
22	1	1	1	3	0.03	238	5	1	1	1	0.06	
24	1	1	2	3	3.52	239	5	1	1	1	0.26	
25	1	1	2	5	1.18	243	5	1	1	2	0.03	
51	1	2	1	2	0.21	247	5	1	2	1	0.15	
52	1	2	1	4	0.05	248	5	1	2	2	0.01	
53	1	2	1	5	0.05	249	5	1	2	2	1.41	
58	1	2	2	4	0.06	250	5	1	2	2	1.00	
59	1	2	2	5	5.56	255	5	1	3	1	0.06	
61	1	3	1	4	0.08	256	5	1	3	1	0.03	
62	1	3	1	5	0.04	257	5	1	3	1	0.02	
66	1	3	2	4	0.04	260	5	1	3	2	0.49	
67	1	3	2	5	0.07	261	5	1	3	2	1.33	
102	2	1	1	3	0.06	307	2	2	2	1	0.08	
103	2	1	1	4	0.02	330	3	2	1	1	0.02	
109	2	1	1	4	0.44	340	3	2	1	1	0.18	
111	2	1	1	5	4.47	343	3	2	1	1	1.06	
112	2	1	1	5	0.03	344	3	2	1	1	3.32	
113	2	1	2	2	0.26	345	3	2	1	1	0.05	
116	2	1	2	4	7.04	346	3	2	1	2	0.14	
117	2	1	2	5	1.21	347	3	2	1	2	0.08	
130	2	2	1	2	3.61	357	3	2	2	1	2.77	
140	2	2	1	5	0.08	358	3	2	2	1	0.18	
141	2	2	2	2	0.05	359	3	2	2	1	1.04	
144	2	2	2	4	0.20	361	3	2	2	2	0.04	
149	2	2	2	5	2.78	362	3	2	2	2	1.04	
150	2	2	2	4	0.02	365	3	2	3	1	0.03	
164	2	3	1	4	0.08	366	3	2	3	1	0.08	
169	3	1	1	2	0.44	368	4	2	1	1	0.06	
170	3	1	1	4	1.18	369	4	2	1	1	0.44	
181	3	1	1	5	0.06	370	4	2	1	1	0.06	
182	3	1	1	2	1.24	371	4	2	2	2	0.06	
184	3	1	2	4	0.44	372	4	2	2	1	0.04	
185	3	1	2	5	0.44	373	4	2	2	2	0.18	
196	3	2	1	2	0.42	411	4	3	1	1	0.08	
197	3	2	1	4	1.00	412	4	3	1	1	0.08	
198	3	2	2	2	0.06	413	4	3	1	1	0.03	
200	3	2	2	4	2.44	414	4	3	1	1	0.03	
201	3	2	2	5	1.18	415	4	3	1	1	0.03	
208	3	3	2	4	0.15	416	4	3	1	2	0.07	
213	4	1	1	3	1.30	424	4	4	1	2	0.40	
214	4	1	1	4	0.03	428	4	4	1	2	0.03	
215	4	1	1	5	1.18	430	4	4	1	2	0.14	
216	4	1	1	2	2.41							
217	4	1	1	4								

DS

Table D3
Terrain Description and Percentage of Area Occupied by Each Terrain Unit in Country B

COUNTRY B									
TERRAIN FACTOR CLASS									
TERRAIN UNIT	CONC MET	INDEX DRY	SLOPE	OBSTACLE HEIGHT	VEGETATION DENSITY	AREA PERCENT	TERRAIN UNIT	CONC MET	INDEX DRY
246	5	1	1	2	2	0.51	246	5	1
248	5	1	1	2	3	1.40	248	5	1
251	5	1	1	2	2	0.83	251	5	1
252	5	1	1	2	3	0.51	252	5	1
253	5	1	1	3	3	0.14	253	5	1
254	5	1	1	3	3	0.48	254	5	1
255	5	1	1	2	2	0.05	255	5	1
256	5	1	2	2	2	0.24	256	5	1
257	5	1	2	2	3	0.85	257	5	1
258	5	1	2	2	2	0.87	258	5	1
259	5	1	2	2	2	2.18	259	5	1
260	5	1	2	2	2	0.85	260	5	1
261	5	1	2	2	3	0.42	261	5	1
262	5	1	2	2	3	1.05	262	5	1
263	5	1	2	2	3	0.05	263	5	1
264	5	1	2	2	3	0.08	264	5	1
265	5	1	2	2	3	0.07	265	5	1
266	5	1	2	2	3	0.04	266	5	1
267	5	1	2	2	3	0.04	267	5	1
268	5	1	2	2	3	0.04	268	5	1
269	5	1	2	2	3	0.04	269	5	1
270	5	1	2	2	3	0.04	270	5	1
271	5	1	2	2	3	0.04	271	5	1
272	5	1	2	2	3	0.04	272	5	1
273	5	1	2	2	3	0.04	273	5	1
274	5	1	2	2	3	0.04	274	5	1
275	5	1	2	2	3	0.04	275	5	1
276	5	1	2	2	3	0.04	276	5	1
277	5	1	2	2	3	0.04	277	5	1
278	5	1	2	2	3	0.04	278	5	1
279	5	1	2	2	3	0.04	279	5	1
280	5	1	2	2	3	0.04	280	5	1
281	5	1	2	2	3	0.04	281	5	1
282	5	1	2	2	3	0.04	282	5	1
283	5	1	2	2	3	0.04	283	5	1
284	5	1	2	2	3	0.04	284	5	1
285	5	1	2	2	3	0.04	285	5	1
286	5	1	2	2	3	0.04	286	5	1
287	5	1	2	2	3	0.04	287	5	1
288	5	1	2	2	3	0.04	288	5	1
289	5	1	2	2	3	0.04	289	5	1
290	5	1	2	2	3	0.04	290	5	1
291	5	1	2	2	3	0.04	291	5	1
292	5	1	2	2	3	0.04	292	5	1
293	5	1	2	2	3	0.04	293	5	1
294	5	1	2	2	3	0.04	294	5	1
295	5	1	2	2	3	0.04	295	5	1
296	5	1	2	2	3	0.04	296	5	1
297	5	1	2	2	3	0.04	297	5	1
298	5	1	2	2	3	0.04	298	5	1
299	5	1	2	2	3	0.04	299	5	1
300	5	1	2	2	3	0.04	300	5	1
301	5	1	2	2	3	0.04	301	5	1
302	5	1	2	2	3	0.04	302	5	1
303	5	1	2	2	3	0.04	303	5	1
304	5	1	2	2	3	0.04	304	5	1
305	5	1	2	2	3	0.04	305	5	1
306	5	1	2	2	3	0.04	306	5	1
307	5	1	2	2	3	0.04	307	5	1
308	5	1	2	2	3	0.04	308	5	1
309	5	1	2	2	3	0.04	309	5	1
310	5	1	2	2	3	0.04	310	5	1
311	5	1	2	2	3	0.04	311	5	1
312	5	1	2	2	3	0.04	312	5	1
313	5	1	2	2	3	0.04	313	5	1
314	5	1	2	2	3	0.04	314	5	1
315	5	1	2	2	3	0.04	315	5	1
316	5	1	2	2	3	0.04	316	5	1
317	5	1	2	2	3	0.04	317	5	1
318	5	1	2	2	3	0.04	318	5	1
319	5	1	2	2	3	0.04	319	5	1
320	5	1	2	2	3	0.04	320	5	1
321	5	1	2	2	3	0.04	321	5	1
322	5	1	2	2	3	0.04	322	5	1
323	5	1	2	2	3	0.04	323	5	1
324	5	1	2	2	3	0.04	324	5	1
325	5	1	2	2	3	0.04	325	5	1
326	5	1	2	2	3	0.04	326	5	1
327	5	1	2	2	3	0.04	327	5	1
328	5	1	2	2	3	0.04	328	5	1
329	5	1	2	2	3	0.04	329	5	1
330	5	1	2	2	3	0.04	330	5	1
331	5	1	2	2	3	0.04	331	5	1
332	5	1	2	2	3	0.04	332	5	1
333	5	1	2	2	3	0.04	333	5	1
334	5	1	2	2	3	0.04	334	5	1
335	5	1	2	2	3	0.04	335	5	1
336	5	1	2	2	3	0.04	336	5	1
337	5	1	2	2	3	0.04	337	5	1
338	5	1	2	2	3	0.04	338	5	1
339	5	1	2	2	3	0.04	339	5	1
340	5	1	2	2	3	0.04	340	5	1
341	5	1	2	2	3	0.04	341	5	1
342	5	1	2	2	3	0.04	342	5	1
343	5	1	2	2	3	0.04	343	5	1
344	5	1	2	2	3	0.04	344	5	1
345	5	1	2	2	3	0.04	345	5	1

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Table D4

Terrain Description and Percentage of Area Occupied for Each Terrain Unit in Country C

COUNTRY C						
TERRAIN FACTOR CLASS						
TERRAIN UNIT	CONT WET	INDEX DRY	SLOPE	OBSTACLE HEIGHT	VEGETATION DENSITY	AREA PERCENT
10	1	1	1	1	3	0.48
22	1	1	1	2	3	0.49
28	1	1	1	2	2	0.66
36	1	1	1	3	2	1.54
47	1	1	2	1	2	0.04
49	1	1	2	1	3	20.33
57	1	1	2	2	3	11.89
62	1	1	2	2	2	16.68
70	1	1	2	3	2	0.02
75	1	1	2	3	3	0.10
79	1	1	3	1	3	4.22
85	1	1	3	2	3	7.25
107	2	1	1	1	3	1.40
115	2	1	1	2	3	0.17
120	2	1	1	2	2	0.04
126	2	1	1	3	2	11.15
135	2	1	2	1	3	0.61
146	2	1	2	2	3	0.30
153	2	1	2	2	2	0.10
167	2	1	3	2	3	0.02
190	3	1	1	3	2	0.84
237	3	1	1	1	3	0.02
271	2	2	1	1	3	3.04
280	2	2	1	2	3	0.00
285	2	2	1	2	2	1.21
292	2	2	1	3	2	5.22
304	2	2	2	1	3	1.10
311	2	2	2	2	3	0.93
314	2	2	2	2	2	0.27
327	2	2	3	1	3	0.08
332	2	2	3	2	3	0.04
342	3	2	1	1	3	0.15
346	3	2	1	2	3	0.06
351	3	2	1	3	2	3.17
392	3	3	1	1	3	0.10
399	3	3	1	3	2	0.07

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Table D5
Terrain Description and Percentage of Area Occupied for Each Terrain Unit in Country D

COUNTRY D											
TERRAIN FACTOR CLASS						TERRAIN FACTOR CLASS					
TERRAIN UNIT	COM. INDEX MET	SLOPE DPT	OBSTACLE HEIGHT	VEGETATION DENSITY	AREA PERCENT	TERRAIN UNIT	COM. INDEX MET	SLOPE DPT	OBSTACLE HEIGHT	VEGETATION DENSITY	AREA PERCENT
9	1	1	1	2	1.35	331	2	3	2	2	1.35
26	1	1	1	2	0.75	334	2	3	2	6	1.35
29	1	1	1	2	0.77	364	3	3	1	2	0.46
35	1	1	1	2	0.44	398	3	3	1	2	0.28
37	1	1	1	2	0.43	391	3	3	1	3	0.43
41	1	1	1	2	0.43	394	3	3	1	6	0.43
48	1	1	1	2	0.46	395	3	3	1	2	0.46
56	1	1	1	2	0.46	400	3	3	1	2	0.46
60	1	1	1	2	0.33	401	3	3	1	3	0.33
63	1	1	1	2	0.33	403	3	3	1	3	0.33
64	1	1	1	2	1.18	404	3	3	1	3	1.18
69	1	1	1	2	0.44	405	3	3	1	3	0.44
71	1	1	1	2	0.41	406	3	3	1	2	0.41
84	1	1	1	2	0.42	408	3	3	1	2	0.42
91	1	1	1	2	3.69	409	3	3	2	2	0.45
92	1	1	1	2	0.12	410	3	3	3	3	0.45
97	1	1	1	2	0.46	418	3	3	3	3	0.45
133	2	1	2	2	6.46	427	4	4	1	3	0.46
151	2	1	2	2	2.35						
154	2	1	2	2	0.46						
162	2	1	3	1	2.87						
166	2	1	3	2	1.89						
178	2	1	3	2	0.48						
172	2	1	3	2	0.48						
269	2	2	1	1	0.48						
278	2	2	1	1	0.47						
274	2	2	1	1	0.43						
276	2	2	1	1	0.42						
279	2	2	1	2	0.48						
283	2	2	1	2	5.53						
286	2	2	1	2	0.45						
289	2	2	1	2	0.44						
293	2	2	1	3	3.17						
294	2	2	1	3	0.43						
297	2	2	1	3	0.41						
298	2	2	1	3	0.46						
302	2	2	2	2	1.01						
303	2	2	2	2	1.41						
306	2	2	2	2	0.42						
308	2	2	2	2	0.42						
309	2	2	2	2	0.46						
318	2	2	2	2	0.40						
313	2	2	2	2	20.07						
320	2	2	2	2	0.45						
321	2	2	2	3	2.74						
323	2	2	2	3	0.42						
324	2	2	2	4	0.45						
325	2	2	3	1	2.40						
326	2	2	3	1	0.47						
329	2	2	3	1	0.49						
330	2	2	3	1	0.45						

DB

Table D6
Terrain Description and Percentage of Area Occupied for Each Terrain Unit in Country E

TERRAIN UNIT	COUNTRY E				
	TERRAIN FACTOR CLASS				
	CONF MET	INDEX	SLOPE	OBSTACLE HEIGHT	VEGETATION DENSITY
1	1	1	1	1	1
2	1	1	1	1	1
3	1	1	1	1	1
4	1	1	1	1	1
5	1	1	1	1	1
6	1	1	1	1	1
7	1	1	1	1	1
8	1	1	1	1	1
9	1	1	1	1	1
10	1	1	1	1	1
11	1	1	1	1	1
12	1	1	1	1	1
13	1	1	1	1	1
14	1	1	1	1	1
15	1	1	1	1	1
16	1	1	1	1	1
17	1	1	1	1	1
18	1	1	1	1	1
19	1	1	1	1	1
20	1	1	1	1	1
21	1	1	1	1	1
22	1	1	1	1	1
23	1	1	1	1	1
24	1	1	1	1	1
25	1	1	1	1	1
26	1	1	1	1	1
27	1	1	1	1	1
28	1	1	1	1	1
29	1	1	1	1	1
30	1	1	1	1	1
31	1	1	1	1	1
32	1	1	1	1	1
33	1	1	1	1	1
34	1	1	1	1	1
35	1	1	1	1	1
36	1	1	1	1	1
37	1	1	1	1	1
38	1	1	1	1	1
39	1	1	1	1	1
40	1	1	1	1	1
41	1	1	1	1	1
42	1	1	1	1	1
43	1	1	1	1	1
44	1	1	1	1	1
45	1	1	1	1	1
46	1	1	1	1	1
47	1	1	1	1	1
48	1	1	1	1	1
49	1	1	1	1	1
50	1	1	1	1	1
51	1	1	1	1	1
52	1	1	1	1	1
53	1	1	1	1	1
54	1	1	1	1	1
55	1	1	1	1	1
56	1	1	1	1	1
57	1	1	1	1	1
58	1	1	1	1	1
59	1	1	1	1	1
60	1	1	1	1	1
61	1	1	1	1	1
62	1	1	1	1	1
63	1	1	1	1	1
64	1	1	1	1	1
65	1	1	1	1	1
66	1	1	1	1	1
67	1	1	1	1	1
68	1	1	1	1	1
69	1	1	1	1	1
70	1	1	1	1	1
71	1	1	1	1	1
72	1	1	1	1	1
73	1	1	1	1	1
74	1	1	1	1	1
75	1	1	1	1	1
76	1	1	1	1	1
77	1	1	1	1	1
78	1	1	1	1	1
79	1	1	1	1	1
80	1	1	1	1	1
81	1	1	1	1	1
82	1	1	1	1	1
83	1	1	1	1	1
84	1	1	1	1	1
85	1	1	1	1	1
86	1	1	1	1	1
87	1	1	1	1	1
88	1	1	1	1	1
89	1	1	1	1	1
90	1	1	1	1	1
91	1	1	1	1	1
92	1	1	1	1	1
93	1	1	1	1	1
94	1	1	1	1	1
95	1	1	1	1	1
96	1	1	1	1	1
97	1	1	1	1	1
98	1	1	1	1	1
99	1	1	1	1	1
100	1	1	1	1	1
101	1	1	1	1	1
102	1	1	1	1	1
103	1	1	1	1	1
104	1	1	1	1	1
105	1	1	1	1	1
106	1	1	1	1	1
107	1	1	1	1	1
108	1	1	1	1	1
109	1	1	1	1	1
110	1	1	1	1	1
111	1	1	1	1	1
112	1	1	1	1	1
113	1	1	1	1	1
114	1	1	1	1	1
115	1	1	1	1	1
116	1	1	1	1	1
117	1	1	1	1	1
118	1	1	1	1	1
119	1	1	1	1	1
120	1	1	1	1	1
121	1	1	1	1	1
122	1	1	1	1	1
123	1	1	1	1	1
124	1	1	1	1	1
125	1	1	1	1	1
126	1	1	1	1	1
127	1	1	1	1	1
128	1	1	1	1	1
129	1	1	1	1	1
130	1	1	1	1	1
131	1	1	1	1	1
132	1	1	1	1	1
133	1	1	1	1	1
134	1	1	1	1	1
135	1	1	1	1	1
136	1	1	1	1	1
137	1	1	1	1	1
138	1	1	1	1	1
139	1	1	1	1	1
140	1	1	1	1	1
141	1	1	1	1	1
142	1	1	1	1	1
143	1	1	1	1	1
144	1	1	1	1	1
145	1	1	1	1	1
146	1	1	1	1	1
147	1	1	1	1	1
148	1	1	1	1	1
149	1	1	1	1	1
150	1	1	1	1	1
151	1	1	1	1	1
152	1	1	1	1	1
153	1	1	1	1	1
154	1	1	1	1	1
155	1	1	1	1	1
156	1	1	1	1	1
157	1	1	1	1	1
158	1	1	1	1	1
159	1	1	1	1	1
160	1	1	1	1	1
161	1	1	1	1	1
162	1	1	1	1	1
163	1	1	1	1	1
164	1	1	1	1	1
165	1	1	1	1	1
166	1	1	1	1	1
167	1	1	1	1	1
168	1	1	1	1	1
169	1	1	1	1	1
170	1	1	1	1	1
171	1	1	1	1	1
172	1	1	1	1	1
173	1	1	1	1	1
174	1	1	1	1	1
175	1	1	1	1	1
176	1	1	1	1	1
177	1	1	1	1	1
178	1	1	1	1	1
179	1	1	1	1	1
180	1	1	1	1	1
181	1	1	1	1	1
182	1	1	1	1	1
183	1	1	1	1	1
184	1	1	1	1	1
185	1	1	1	1	1
186	1	1	1	1	1
187	1	1	1	1	1
188	1	1	1	1	1
189	1	1	1	1	1
190	1	1	1	1	1
191	1	1	1	1	1
192	1	1	1	1	1
193	1	1	1	1	1
194	1	1	1	1	1
195	1	1	1	1	1
196	1	1	1	1	1
197	1	1	1	1	1
198	1	1	1	1	1
199	1	1	1	1	1
200	1	1	1	1	1

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Table D7
Terrain Description and Percentage of Area Occupied for Each Terrain Unit in Country F

Country F												
Country F												
Terrain Unit	Terrain Factor Class					Area Percent	Terrain Factor Class					
	Cone MFT	Index Dry	Slope	Obstacle Height	Vegetation Density		Cone MFT	Index Dry	Slope	Obstacle Height	Vegetation Density	Area Percent
9	1	1	1	1	2	0.12	191	3	1	1	3	7.80
21	1	1	1	2	2	0.18	192	3	1	1	3	8.06
24	1	1	1	2	5	0.02	194	3	1	1	4	8.04
26	1	1	1	2	6	19.08	195	3	1	2	4	8.05
29	1	1	1	2	2	0.06	202	3	1	2	9	8.22
34	1	1	1	2	5	0.05	205	3	1	2	3	8.14
39	1	1	1	2	4	1.24	209	3	1	3	2	8.06
37	1	1	1	3	2	1.24	210	3	1	3	2	8.04
48	1	1	1	3	5	0.06	211	3	1	3	3	8.05
41	1	1	1	3	3	0.14	269	2	2	1	1	8.04
43	1	1	1	4	6	0.12	274	2	2	1	1	8.03
49	1	1	2	1	6	0.14	283	2	2	1	2	3.78
58	1	1	2	2	5	0.24	208	2	2	2	2	8.09
60	1	1	2	2	6	4.50	201	2	2	1	2	8.00
63	1	1	2	2	2	0.05	203	2	2	1	3	8.14
68	1	1	2	2	5	0.17	207	2	2	1	3	8.03
69	1	1	2	2	6	14.11	209	2	2	1	4	8.04
71	1	1	2	3	2	0.21	288	2	2	1	4	8.05
73	1	1	2	3	5	0.03	382	2	2	2	1	8.05
74	1	1	2	3	6	0.06	386	2	2	2	2	8.03
76	1	1	2	4	6	0.03	313	2	2	2	2	1.15
77	1	1	3	1	6	0.01	334	2	2	3	2	8.00
88	1	1	3	2	2	1.19	341	3	2	1	1	8.00
91	1	1	3	2	2	0.18	349	3	2	1	2	8.74
95	1	1	3	2	5	0.15	358	3	2	1	2	8.04
97	1	1	3	2	6	17.01	352	3	2	1	3	8.05
98	1	1	3	3	2	0.17	353	3	2	1	3	8.06
100	1	1	3	3	6	0.08	354	3	2	1	4	8.03
106	2	1	1	1	2	0.04	355	3	2	1	4	8.05
114	2	1	1	2	2	0.08	363	3	2	2	2	8.04
116	2	1	1	2	5	0.24	367	3	2	3	2	8.17
118	2	1	1	2	6	0.45	389	3	3	1	1	8.18
124	2	1	1	2	5	0.08	426	4	4	1	1	8.18
127	2	1	1	3	2	13.01	429	4	4	1	2	8.06
129	2	1	1	3	5	0.27	433	4	4	1	3	8.03
130	2	1	1	3	6	0.04	434	4	4	1	4	8.05
145	2	1	2	2	2	0.03	435	4	4	1	4	8.06
149	2	1	2	2	5	0.03	436	4	4	1	4	8.18
151	2	1	2	2	6	0.19	437	4	4	1	4	8.18
156	2	1	2	2	5	0.03	440	4	4	2	4	8.04
157	2	1	2	3	5	0.30	441	4	4	3	2	8.01
178	2	1	3	2	6	0.08	442	4	4	3	2	8.01
174	2	1	3	3	2	0.03						
175	2	1	3	3	6	0.01						
176	3	1	1	1	2	0.01						
177	3	1	1	1	2	0.04						
183	3	1	1	2	2	0.03						
186	3	1	1	2	6	1.41						
187	3	1	1	2	2	0.21						
188	3	1	1	2	5	0.05						
189	3	1	1	2	6	0.01						

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Table D8

Terrain Description and Percentage of Area Occupied for Each Terrain Unit in Country G

COUNTRY G						
TERRAIN FACTOR CLASS						
TERRAIN UNIT	CONF MET	INDEX DRY	SLOPE	OBSTACLE HEIGHT	VEGETATION DENSITY	AREA PERCENT
1	1	1	1	1	2	0.04
4	1	1	1	1	4	0.04
8	1	1	1	1	2	0.26
27	1	1	1	2	1	0.18
30	1	1	1	2	3	0.68
32	1	1	1	2	4	0.14
46	1	1	2	1	1	0.60
61	1	1	2	2	1	0.06
66	1	1	2	2	4	0.13
80	1	1	3	2	1	1.05
104	2	1	1	1	1	0.07
105	2	1	1	1	2	0.55
119	2	1	1	2	2	0.20
121	2	1	1	2	3	0.53
123	2	1	1	2	4	0.48
132	2	1	2	1	2	12.17
134	2	1	2	1	3	0.10
136	2	1	2	1	4	1.00
143	2	1	2	2	2	0.13
147	2	1	2	2	4	0.18
152	2	1	2	2	2	0.07
155	2	1	2	2	3	0.72
161	2	1	3	1	2	2.01
163	2	1	3	1	3	0.09
168	2	1	3	2	4	0.13
272	2	2	1	1	4	0.09
278	2	2	1	2	2	0.09
281	2	2	1	2	1	0.07
287	2	2	1	2	3	2.45
289	2	2	1	2	4	0.81
301	2	2	2	1	2	0.17
305	2	2	2	1	4	0.07
316	2	2	2	2	3	2.48
318	2	2	2	2	4	0.28
328	2	2	3	1	4	0.04
335	2	2	3	2	3	0.50
422	4	4	1	1	2	0.37
425	4	4	1	1	4	0.04
430	4	4	1	2	4	0.03
438	4	4	2	1	2	0.03
451	1	1	1	1	1	11.34
453	1	1	1	2	1	3.76

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Table D9

Terrain Description and Percentage of Area Occupied for Each Terrain Unit in Country H

COUNTRY H						
TERRAIN FACTOR CLASS						
TERRAIN UNIT	CONF WET	INDEX DRY	SLOPE	OBSTACLE HEIGHT	VEGETATION DENSITY	AREA PERCENT
27	1	1	1	2	1	12.41
61	1	1	2	2	1	2.43
83	1	1	3	2	1	4.36
89	1	1	3	2	1	53.68
386	3	3	1	1	2	0.01
394	3	3	1	2	1	0.45
396	3	3	1	2	2	0.10
450	1	1	1	1	2	0.18
452	1	1	1	2	1	24.20
454	1	1	3	2	1	2.19

D/L

Table D10

Terrain Description and Percentage of Area Occupied for Each Terrain Unit in Country I

COUNTRY I						
TERRAIN FACTOR CLASS						
TERRAIN UNIT	COND WET	INDEX DRY	SLOPE	OBSTACLE HEIGHT	VEGETATION DENSITY	AREA PERCENT
1	1	1	1	1	1	0.03
2	1	1	1	1	2	1.29
3	1	1	1	1	4	0.01
4	1	1	1	2	1	46.79
5	1	1	1	2	2	0.04
6	1	1	1	2	4	0.20
7	1	1	1	2	6	0.02
8	1	1	1	3	1	0.06
9	1	1	1	4	4	0.01
10	1	1	2	1	1	0.07
11	1	1	2	1	2	0.39
12	1	1	2	1	4	0.03
13	1	1	2	2	1	10.32
14	1	1	2	2	2	0.15
15	1	1	2	2	4	0.45
16	1	1	2	2	6	0.22
17	1	1	2	3	1	0.03
18	1	1	2	4	1	0.03
19	1	1	3	1	2	0.18
20	1	1	3	1	4	0.07
21	1	1	3	1	6	0.01
22	1	1	3	2	1	3.34
23	1	1	3	2	2	0.14
24	1	1	3	2	4	0.20
25	1	1	3	2	6	0.06
26	1	1	3	3	2	0.01
27	1	1	3	4	1	0.02
28	1	1	3	4	6	0.02
29	2	1	1	1	1	0.02
30	2	1	1	1	2	0.27
31	2	1	1	2	1	0.00
32	2	1	1	2	4	0.14
33	2	1	1	3	2	0.01
34	2	1	2	1	1	0.01
35	2	1	2	1	2	0.11
36	2	1	2	1	4	0.03
37	2	1	2	1	6	0.01
38	2	1	2	2	1	2.12
39	2	1	2	2	4	0.70
40	2	1	2	2	6	0.07
41	2	1	2	4	4	0.05
42	2	1	3	1	4	0.03
43	2	1	3	2	1	0.44
44	3	1	1	1	2	0.05
45	3	1	1	2	1	1.00
46	3	1	1	2	2	0.01
47	3	2	1	1	2	0.03
48	5	5	1	1	1	8.39
49	5	5	2	1	1	0.65
50	5	5	3	1	1	0.30
51	1	1	1	4	1	18.49

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**APPENDIX E: BASIC PERFORMANCE PREDICTIONS FOR HIMO
WEST GERMANY AND MID-EAST STUDY AREAS**

1. Appendix E contains most of the basic performance data (speed profiles and diagnostic statistics) for the selected study vehicles in the HIMO West Germany and Mid-East study areas and for the same vehicles over the selected artillery missions. Also included in Appendix E are the speed profile data for the selected groups of vehicles traveling together in the HIMO study areas.

2. The speed profile data (see paragraphs 27 and 28 main text) for the selected study vehicles over primary roads, secondary roads, trails, and off-road terrain for two conditions are given in Tables E1-E43 as follows:

<u>Table</u>	<u>Speed Profiles for Study Vehicles</u>
E1	M561-M102
E2	M561-M204
E3	M561-XM198
E4	M35A2-M102
E5	M35A2-XM204
E6	M35A2-XM198
E7	M813-XM204
E8	M813-M114A1
E9	M813-XM198
E10	M813-FH70
E11	M813-XM(130-mm)
E12	M656-XM204
E13	M656-XM198
E14	TDW901-XM204
E15	TDW901-M114A1
E16	TDW901-XM198
E17	TDW901-FH70
E18	TDW901-XM(130-mm)
E19	M520E1-XM204

<u>Table</u>	<u>Speed Profiles for Study Vehicles</u>
E20	M520E1-XM198
E21	M520E1-FH70
E22	M125E1-XM198
E23	M548E1-XM204
E24	M548E1-XM198
E25	M548E1-FH70
E26	UET-XM198
E27	UET-FH70
E28	ASV-XM204
E29	ASV-XM198
E30	ASV-FH70
E31	M109A1
E32	M107
E33	M110E2
E34	M113A1
E35	M60A2
E36	M548E1
E37	M577A1
E38	XM723
E39	XM1
E40	ASV
E41	M561
E42	M813
E43	UET

3. The diagnostic statistics (see paragraph 31, main text) for the selected study vehicles over primary roads, secondary roads, and trails for two conditions in the HIMO West Germany and Mid-East study areas are given in Tables E44-E87 as follows:

<u>Table</u>	<u>Diagnostic Statistics for Study Vehicles</u>
E44	M561-M102
E45	M561-XM204

TableDiagnostic Statistics for Study Vehicles

E46	M561-XM198
E47	M35A2-M102
E48	M35A2-XM204
E49	M35A2-XM198
E50	M813-XM204
E51	M813-M114A1
E52	M813-XM198
E53	M813-FH70
E54	M813-XM(130-mm)
E55	M656-XM204
E56	M656-XM198
E57	TDW901-XM204
E58	TDW901-M114A1
E59	TDW901-XM198
E60	TDW901-FH70
E61	TDW901-XM(130-mm)
E62	M520E1-XM204
E63	M520E1-XM198
E64	M520E1-FH70
E65	M125E1-XM198
E66	M548E1-XM204
E67	M548E1-XM198
E68	M548E1-FH70
E69	UET-XM198
E70	UET-FH70
E71	ASV-XM204
E72	ASV-XM198
E73	ASV-FH70
E74	M109A1
E75	M107
E76	M110E2
E77	M113A1
E78	M60A2

<u>Table</u>	<u>Diagnostic Statistics for Study Vehicles</u>
E79	M548E1
E80	M577A1
E81	XM723
E82	XM1
E83	ASV
E84	M561
E85	M813
E86	UET

4. The diagnostic statistics for the selected vehicles in off-road terrain of the HIMO West Germany and Mid-East study areas for two conditions are given in Table E87. The speed profile data for the selected groups of vehicles (see paragraph 36 and 37, main text) traveling together over primary roads, secondary roads, trails, and off-road terrain for two conditions are given in Tables E88-E91 as follows:

<u>Table</u>	<u>Vehicle Group</u>
E88	1
E89	2
E90	3
E91	4

5. The time to complete the selected artillery missions in the West Germany study area for two conditions are given in Table E92 for the study prime mover-towed artillery combinations, and in Table E93 for the self-propelled artillery and reference vehicles.

Table E1 Speed Profile for

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Table E2
Speed Profile for MS1-2004

Primary Roads			Secondary Roads			Trails			Off-Road		
Percent Total Distance			Percent Total Distance			Percent Total Distance			Percent Total Distance		
100	2	4	100	2	4	100	2	4	100	2	4
1	55.0	55.0	55.0	55.0	55.0	1	50.7	47.7	1	24.9	26.7
2	55.0	55.0	55.0	55.0	55.0	2	41.1	42.9	2	23.6	23.3
3	55.0	55.0	55.0	55.0	55.0	3	36.4	39.6	3	21.9	21.6
4	55.0	55.0	55.0	55.0	55.0	4	31.2	36.6	4	20.3	20.1
5	55.0	55.0	55.0	55.0	55.0	5	26.8	33.2	5	18.4	17.8
6	55.0	55.0	55.0	55.0	55.0	6	22.1	29.6	6	16.1	15.5
7	55.0	55.0	55.0	55.0	55.0	7	17.9	25.2	7	13.8	13.2
8	55.0	55.0	55.0	55.0	55.0	8	13.8	20.8	8	11.5	10.9
9	55.0	55.0	55.0	55.0	55.0	9	9.9	16.4	9	9.2	8.6
10	55.0	55.0	55.0	55.0	55.0	10	6.0	11.7	10	6.0	5.4
11	55.0	55.0	55.0	55.0	55.0	11	2.4	4.4	11	2.4	2.3
12	55.0	55.0	55.0	55.0	55.0	12	0.0	0.0	12	0.0	0.0
13	55.0	55.0	55.0	55.0	55.0	13	0.0	0.0	13	0.0	0.0
14	55.0	55.0	55.0	55.0	55.0	14	0.0	0.0	14	0.0	0.0
15	55.0	55.0	55.0	55.0	55.0	15	0.0	0.0	15	0.0	0.0
16	55.0	55.0	55.0	55.0	55.0	16	0.0	0.0	16	0.0	0.0
17	55.0	55.0	55.0	55.0	55.0	17	0.0	0.0	17	0.0	0.0
18	55.0	55.0	55.0	55.0	55.0	18	0.0	0.0	18	0.0	0.0
19	55.0	55.0	55.0	55.0	55.0	19	0.0	0.0	19	0.0	0.0
20	55.0	55.0	55.0	55.0	55.0	20	0.0	0.0	20	0.0	0.0
21	55.0	55.0	55.0	55.0	55.0	21	0.0	0.0	21	0.0	0.0
22	55.0	55.0	55.0	55.0	55.0	22	0.0	0.0	22	0.0	0.0
23	55.0	55.0	55.0	55.0	55.0	23	0.0	0.0	23	0.0	0.0
24	55.0	55.0	55.0	55.0	55.0	24	0.0	0.0	24	0.0	0.0
25	55.0	55.0	55.0	55.0	55.0	25	0.0	0.0	25	0.0	0.0
26	55.0	55.0	55.0	55.0	55.0	26	0.0	0.0	26	0.0	0.0
27	55.0	55.0	55.0	55.0	55.0	27	0.0	0.0	27	0.0	0.0
28	55.0	55.0	55.0	55.0	55.0	28	0.0	0.0	28	0.0	0.0
29	55.0	55.0	55.0	55.0	55.0	29	0.0	0.0	29	0.0	0.0
30	55.0	55.0	55.0	55.0	55.0	30	0.0	0.0	30	0.0	0.0
31	55.0	55.0	55.0	55.0	55.0	31	0.0	0.0	31	0.0	0.0
32	55.0	55.0	55.0	55.0	55.0	32	0.0	0.0	32	0.0	0.0
33	55.0	55.0	55.0	55.0	55.0	33	0.0	0.0	33	0.0	0.0
34	55.0	55.0	55.0	55.0	55.0	34	0.0	0.0	34	0.0	0.0
35	55.0	55.0	55.0	55.0	55.0	35	0.0	0.0	35	0.0	0.0
36	55.0	55.0	55.0	55.0	55.0	36	0.0	0.0	36	0.0	0.0
37	55.0	55.0	55.0	55.0	55.0	37	0.0	0.0	37	0.0	0.0
38	55.0	55.0	55.0	55.0	55.0	38	0.0	0.0	38	0.0	0.0
39	55.0	55.0	55.0	55.0	55.0	39	0.0	0.0	39	0.0	0.0
40	55.0	55.0	55.0	55.0	55.0	40	0.0	0.0	40	0.0	0.0
41	55.0	55.0	55.0	55.0	55.0	41	0.0	0.0	41	0.0	0.0
42	55.0	55.0	55.0	55.0	55.0	42	0.0	0.0	42	0.0	0.0
43	55.0	55.0	55.0	55.0	55.0	43	0.0	0.0	43	0.0	0.0
44	55.0	55.0	55.0	55.0	55.0	44	0.0	0.0	44	0.0	0.0
45	55.0	55.0	55.0	55.0	55.0	45	0.0	0.0	45	0.0	0.0
46	55.0	55.0	55.0	55.0	55.0	46	0.0	0.0	46	0.0	0.0
47	55.0	55.0	55.0	55.0	55.0	47	0.0	0.0	47	0.0	0.0
48	55.0	55.0	55.0	55.0	55.0	48	0.0	0.0	48	0.0	0.0
49	55.0	55.0	55.0	55.0	55.0	49	0.0	0.0	49	0.0	0.0
50	55.0	55.0	55.0	55.0	55.0	50	0.0	0.0	50	0.0	0.0
51	55.0	55.0	55.0	55.0	55.0	51	0.0	0.0	51	0.0	0.0
52	55.0	55.0	55.0	55.0	55.0	52	0.0	0.0	52	0.0	0.0
53	55.0	55.0	55.0	55.0	55.0	53	0.0	0.0	53	0.0	0.0
54	55.0	55.0	55.0	55.0	55.0	54	0.0	0.0	54	0.0	0.0
55	55.0	55.0	55.0	55.0	55.0	55	0.0	0.0	55	0.0	0.0
56	55.0	55.0	55.0	55.0	55.0	56	0.0	0.0	56	0.0	0.0
57	55.0	55.0	55.0	55.0	55.0	57	0.0	0.0	57	0.0	0.0
58	55.0	55.0	55.0	55.0	55.0	58	0.0	0.0	58	0.0	0.0
59	55.0	55.0	55.0	55.0	55.0	59	0.0	0.0	59	0.0	0.0
60	55.0	55.0	55.0	55.0	55.0	60	0.0	0.0	60	0.0	0.0
61	55.0	55.0	55.0	55.0	55.0	61	0.0	0.0	61	0.0	0.0
62	55.0	55.0	55.0	55.0	55.0	62	0.0	0.0	62	0.0	0.0
63	55.0	55.0	55.0	55.0	55.0	63	0.0	0.0	63	0.0	0.0
64	55.0	55.0	55.0	55.0	55.0	64	0.0	0.0	64	0.0	0.0
65	55.0	55.0	55.0	55.0	55.0	65	0.0	0.0	65	0.0	0.0
66	55.0	55.0	55.0	55.0	55.0	66	0.0	0.0	66	0.0	0.0
67	55.0	55.0	55.0	55.0	55.0	67	0.0	0.0	67	0.0	0.0
68	55.0	55.0	55.0	55.0	55.0	68	0.0	0.0	68	0.0	0.0
69	55.0	55.0	55.0	55.0	55.0	69	0.0	0.0	69	0.0	0.0
70	55.0	55.0	55.0	55.0	55.0	70	0.0	0.0	70	0.0	0.0
71	55.0	55.0	55.0	55.0	55.0	71	0.0	0.0	71	0.0	0.0
72	55.0	55.0	55.0	55.0	55.0	72	0.0	0.0	72	0.0	0.0
73	55.0	55.0	55.0	55.0	55.0	73	0.0	0.0	73	0.0	0.0
74	55.0	55.0	55.0	55.0	55.0	74	0.0	0.0	74	0.0	0.0
75	55.0	55.0	55.0	55.0	55.0	75	0.0	0.0	75	0.0	0.0
76	55.0	55.0	55.0	55.0	55.0	76	0.0	0.0	76	0.0	0.0
77	55.0	55.0	55.0	55.0	55.0	77	0.0	0.0	77	0.0	0.0
78	55.0	55.0	55.0	55.0	55.0	78	0.0	0.0	78	0.0	0.0
79	55.0	55.0	55.0	55.0	55.0	79	0.0	0.0	79	0.0	0.0
80	55.0	55.0	55.0	55.0	55.0	80	0.0	0.0	80	0.0	0.0
81	55.0	55.0	55.0	55.0	55.0	81	0.0	0.0	81	0.0	0.0
82	55.0	55.0	55.0	55.0	55.0	82	0.0	0.0	82	0.0	0.0
83	55.0	55.0	55.0	55.0	55.0	83	0.0	0.0	83	0.0	0.0
84	55.0	55.0	55.0	55.0	55.0	84	0.0	0.0	84	0.0	0.0
85	55.0	55.0	55.0	55.0	55.0	85	0.0	0.0	85	0.0	0.0
86	55.0	55.0	55.0	55.0	55.0	86	0.0	0.0	86	0.0	0.0
87	55.0	55.0	55.0	55.0	55.0	87	0.0	0.0	87	0.0	0.0
88	55.0	55.0	55.0	55.0	55.0	88	0.0	0.0	88	0.0	0.0
89	55.0	55.0	55.0	55.0	55.0	89	0.0	0.0	89	0.0	0.0
90	55.0	55.0	55.0	55.0	55.0	90	0.0	0.0	90	0.0	0.0
91	55.0	55.0	55.0	55.0	55.0	91	0.0	0.0	91	0.0	0.0
92	55.0	55.0	55.0	55.0	55.0	92	0.0	0.0	92	0.0	0.0
93	55.0	55.0	55.0	55.0	55.0	93	0.0	0.0	93	0.0	0.0
94	55.0	55.0	55.0	55.0	55.0	94	0.0	0.0	94	0.0	0.0
95	55.0	55.0	55.0	55.0	55.0	95	0.0	0.0	95	0.0	0.0
96	55.0	55.0	55.0	55.0	55.0	96	0.0	0.0	96	0.0	0.0
97	55.0	55.0	55.0	55.0	55.0	97	0.0	0.0	97	0.0	0.0
98	55.0	55.0	55.0	55.0	55.0	98	0.0	0.0	98	0.0	0.0
99	55.0	55.0	55.0	55.0	55.0	99	0.0	0.0	99	0.0	0.0
100	55.0	55.0	55.0	55.0	55.0	100	0.0	0.0	100	0.0	0.0

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Table E3
Speed Profile for MS61-XM198

Primary Roads

PERCENT TOTAL DISTANCE

km	2	4	6	8
1	34.1	34.1	34.1	34.1
2	33.0	32.9	32.7	32.6
3	32.5	32.4	32.3	32.2
4	32.2	32.1	31.9	31.7
5	31.4	31.2	30.9	30.7
6	30.0	29.5	28.9	28.3
7	27.4	27.0	26.6	26.3
8	25.6	25.3	25.0	24.6
9	23.7	23.3	22.9	22.5
10	21.3			

Secondary Roads

PERCENT TOTAL DISTANCE

km	2	4	6	8
1	29.6	29.0	28.1	26.4
2	27.5	27.1	26.8	26.3
3	26.1	26.0	25.9	25.8
4	25.6	25.6	25.5	25.1
5	25.0	24.8	24.5	24.1
6	23.4	23.1	22.9	22.2
7	22.0	21.7	21.5	21.1
8	20.9	20.7	20.5	20.2
9	18.8	18.4	18.2	17.5
10	17.1			

Trails

PERCENT TOTAL DISTANCE

km	2	4	6	8
1	19.0	18.9	18.3	17.9
2	17.5	17.4	17.3	17.1
3	16.3	16.0	15.4	15.1
4	14.9	14.7	14.3	14.0
5	13.8	13.4	13.3	13.1
6	12.9	12.7	12.5	12.2
7	12.1	11.9	11.7	11.5
8	11.1	10.7	10.3	10.0
9	9.4	9.2	8.9	8.5
10	8.4	8.4	8.4	8.4

Off-Road

PERCENT TOTAL DISTANCE

km	2	4	6	8
1	20.0	20.0	17.3	16.4
2	15.5	14.7	14.2	13.3
3	13.0	12.6	12.4	11.9
4	11.6	11.4	11.2	10.8
5	10.6	10.2	10.1	9.9
6	9.8	9.6	9.5	9.2
7	9.1	8.9	8.8	8.6
8	8.3	8.1	8.0	7.8
9	7.4	7.2	7.1	6.9
10	6.5	6.5	6.4	6.4

West Germany - Snow Condition

PERCENT TOTAL DISTANCE

km	2	4	6	8
1	14.6	14.6	14.6	14.6
2	14.6	14.6	14.6	14.6
3	14.6	14.6	14.6	14.6
4	14.6	14.6	14.6	14.6
5	14.6	14.6	14.6	14.6
6	14.6	14.6	14.6	14.6
7	14.6	14.6	14.6	14.6
8	14.6	14.6	14.6	14.6
9	14.6	14.6	14.6	14.6
10	14.6	14.6	14.6	14.6

PERCENT TOTAL DISTANCE

km	2	4	6	8
1	13.1	12.7	11.9	11.5
2	11.3	11.2	11.1	11.0
3	10.5	10.3	10.2	10.0
4	9.3	9.0	8.5	8.2
5	7.7	7.5	7.3	7.0
6	6.1	5.9	5.7	5.5
7	4.5	4.4	4.3	4.2
8	3.0	2.9	2.8	2.7
9	1.5	1.4	1.3	1.2
10	0.5	0.5	0.5	0.5

PERCENT TOTAL DISTANCE

km	2	4	6	8
1	20.0	20.0	17.2	16.4
2	14.5	13.5	12.7	11.9
3	10.5	9.9	9.3	8.5
4	7.7	7.5	7.3	7.0
5	6.1	5.9	5.7	5.5
6	4.5	4.4	4.3	4.2
7	3.0	2.9	2.8	2.7
8	1.5	1.4	1.3	1.2
9	0.5	0.5	0.5	0.5
10	0.1	0.1	0.1	0.1

Mid-East - Wet Condition

PERCENT TOTAL DISTANCE

km	2	4	6	8
1	29.6	29.0	28.1	26.4
2	27.5	27.1	26.8	26.3
3	26.1	26.0	25.9	25.8
4	25.6	25.6	25.5	25.1
5	25.0	24.8	24.5	24.1
6	23.4	23.1	22.9	22.2
7	22.0	21.7	21.5	21.1
8	20.9	20.7	20.5	20.2
9	18.8	18.4	18.2	17.5
10	17.1			

PERCENT TOTAL DISTANCE

km	2	4	6	8
1	19.0	18.9	18.3	17.9
2	17.5	17.4	17.3	17.1
3	16.3	16.0	15.4	15.1
4	14.9	14.7	14.3	14.0
5	13.8	13.4	13.3	13.1
6	12.9	12.7	12.5	12.2
7	12.1	11.9	11.7	11.5
8	11.1	10.7	10.3	10.0
9	9.4	9.2	8.9	8.5
10	8.4	8.4	8.4	8.4

PERCENT TOTAL DISTANCE

km	2	4	6	8
1	15.7	15.3	15.2	14.2
2	13.1	12.6	12.4	11.9
3	11.2	11.0	10.8	10.3
4	10.2	10.0	9.8	9.5
5	9.2	9.0	8.8	8.6
6	8.3	8.1	8.0	7.8
7	7.4	7.2	7.1	6.9
8	6.5	6.5	6.4	6.4
9	5.6	5.6	5.5	5.5
10	4.7	4.7	4.6	4.6

Mid-East - Sand Condition

PERCENT TOTAL DISTANCE

km	2	4	6	8
1	29.6	29.0	28.1	26.4
2	27.5	27.1	26.8	26.3
3	26.1	26.0	25.9	25.8
4	25.6	25.6	25.5	25.1
5	25.0	24.8	24.5	24.1
6	23.4	23.1	22.9	22.2
7	22.0	21.7	21.5	21.1
8	20.9	20.7	20.5	20.2
9	18.8	18.4	18.2	17.5
10	17.1			

PERCENT TOTAL DISTANCE

km	2	4	6	8
1	19.0	18.9	18.3	17.9
2	17.5	17.4	17.3	17.1
3	16.3	16.0	15.4	15.1
4	14.9	14.7	14.3	14.0
5	13.8	13.4	13.3	13.1
6	12.9	12.7	12.5	12.2
7	12.1	11.9	11.7	11.5
8	11.1	10.7	10.3	10.0
9	9.4	9.2	8.9	8.5
10	8.4	8.4	8.4	8.4

PERCENT TOTAL DISTANCE

km	2	4	6	8
1	15.0	15.0	15.0	15.0
2	14.0	14.0	14.0	14.0
3	13.0	13.0	13.0	13.0
4	12.0	12.0	12.0	12.0
5	11.0	11.0	11.0	11.0
6	10.0	10.0	10.0	10.0
7	9.0	9.0	9.0	9.0
8	8.0	8.0	8.0	8.0
9	7.0	7.0	7.0	7.0
10	6.0	6.0	6.0	6.0

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Table E4
Speed Profile for M35A2-M102

[illegible]

Table ES
Speed Profile for MS42-UN204

Primary Roads			Secondary Roads			Trails			Off-Road		
PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE		
100	2	4	100	2	4	100	2	4	100	2	4
1A 58.0 58.0 58.0 58.0 58.0			1A 45.6 45.6 45.6 45.6 45.6			1A 29.1 29.1 29.1 29.1 29.1			1A 24.1 24.1 24.1 24.1 24.1		
2A 58.0 58.0 58.0 58.0 58.0			2A 44.4 44.4 44.4 44.4 44.4			2A 24.6 24.6 24.6 24.6 24.6			2A 18.9 18.9 18.9 18.9 18.9		
3A 57.1 56.8 56.6 56.3 56.1			3A 42.3 42.0 41.7 41.3 41.0			3A 22.2 21.9 21.5 21.1 20.7			3A 16.9 16.7 16.5 16.3 16.0		
4A 55.5 54.8 54.1 53.5 52.9			4A 40.6 40.2 39.9 39.5 39.1			4A 18.6 18.6 18.6 18.3 18.1			4A 15.0 15.0 15.0 15.0 15.0		
5A 52.2 51.5 50.7 49.9 49.3			5A 38.7 38.2 37.8 37.4 36.9			5A 17.1 17.0 17.0 17.0 17.0			5A 14.4 14.2 14.1 14.0 13.9		
6A 48.6 48.1 47.6 47.1 46.6			6A 34.7 34.3 34.0 33.7 33.3			6A 17.1 16.9 16.8 16.7 16.6			6A 13.7 13.5 13.4 13.2 13.1		
7A 46.1 45.3 44.4 43.5 42.4			7A 32.6 32.3 32.0 31.7 31.3			7A 16.5 16.4 16.3 16.2 16.1			7A 12.9 12.8 12.8 12.4 12.2		
8A 41.1 40.8 39.8 37.4 36.0			8A 30.3 29.7 29.1 28.5 27.7			8A 16.8 16.8 16.8 16.8 16.8			8A 12.0 11.8 11.6 11.4 11.1		
9A 34.7 33.5 32.5 31.4 30.0			9A 27.0 26.4 25.7 25.0 24.1			9A 15.5 15.3 15.0 14.4 13.6			9A 10.8 10.6 10.5 10.4 10.3		
10A 28.4			10A 23.2			10A 13.3			10A 1.0		
PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE		
100	2	4	100	2	4	100	2	4	100	2	4
1A 16.9 16.9 16.9 16.9 16.9			1A 13.1 12.9 12.4 12.2 12.1			1A 18.7 18.6 18.6 18.6 18.6			1A 20.0 20.0 20.0 20.0 20.0		
2A 13.1 13.0 12.9 12.8 12.7			2A 12.0 12.0 11.9 11.9 11.9			2A 18.4 18.4 18.4 18.4 18.4			2A 14.5 14.5 14.5 14.5 14.5		
3A 12.7 12.6 12.6 12.5 12.5			3A 11.9 11.9 11.9 11.9 11.9			3A 18.3 18.3 18.3 18.3 18.3			3A 11.0 11.0 11.0 11.0 11.0		
4A 12.5 12.4 12.4 12.4 12.3			4A 11.8 11.8 11.8 11.8 11.8			4A 18.3 18.3 18.3 18.3 18.3			4A 10.4 10.3 10.2 10.2 10.2		
5A 12.3 12.3 12.3 12.3 12.2			5A 11.8 11.8 11.8 11.8 11.8			5A 18.2 18.2 18.2 18.2 18.2			5A 9.9 9.9 9.9 9.9 9.9		
6A 12.2 12.2 12.2 12.2 12.2			6A 11.7 11.7 11.7 11.7 11.7			6A 18.1 18.1 18.1 18.1 18.1			6A 9.5 9.4 9.4 9.4 9.4		
7A 12.2 12.1 12.1 12.1 12.1			7A 11.7 11.6 11.6 11.6 11.6			7A 18.1 18.1 18.1 18.1 18.1			7A 9.1 9.0 9.0 9.0 9.0		
8A 12.1 12.1 12.1 12.0 12.0			8A 11.6 11.5 11.5 11.4 11.4			8A 18.0 18.0 18.0 18.0 18.0			8A 8.4 8.4 8.4 8.4 8.4		
9A 12.0 12.0 12.0 12.0 11.9			9A 11.4 11.3 11.3 11.3 11.3			9A 9.9 9.7 9.5 9.4 9.4			9A 1.0 0.8 0.7 0.6 0.6		
10A 11.8			10A 2.6			10A 1.7			10A 0.5		
PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE		
100	2	4	100	2	4	100	2	4	100	2	4
1A 32.6 32.6 32.6 32.6 32.6			1A 45.8 45.8 45.8 45.8 45.8			1A 28.4 28.4 28.4 28.4 28.4			1A 20.4 20.4 20.4 20.4 20.4		
2A 32.6 32.6 32.6 32.6 32.6			2A 44.8 44.8 44.8 44.8 44.8			2A 24.9 24.9 24.9 24.9 24.9			2A 17.7 17.7 17.7 17.7 17.7		
3A 32.6 32.6 32.6 32.6 32.6			3A 43.8 43.8 43.8 43.8 43.8			3A 21.6 21.6 21.6 21.6 21.6			3A 16.0 15.9 15.9 15.9 15.9		
4A 32.6 32.6 32.6 32.6 32.6			4A 42.7 42.7 42.7 42.7 42.7			4A 21.5 21.5 21.5 21.5 21.5			4A 14.9 14.7 14.5 14.3 14.2		
5A 32.6 32.6 32.6 32.6 32.6			5A 42.6 42.6 42.6 42.6 42.6			5A 20.1 20.1 20.1 20.1 20.1			5A 13.4 13.2 13.0 12.8 12.7		
6A 32.6 32.6 32.6 32.6 32.6			6A 40.4 40.4 40.4 40.4 40.4			6A 18.7 18.7 18.7 18.7 18.7			6A 12.6 12.4 12.3 12.2 12.1		
7A 32.6 32.6 32.6 32.6 32.6			7A 38.6 38.6 38.6 38.6 38.6			7A 17.2 17.2 17.2 17.2 17.2			7A 11.8 11.6 11.5 11.4 11.3		
8A 32.6 32.6 32.6 32.6 32.6			8A 35.1 35.1 35.1 35.1 35.1			8A 16.2 16.2 16.2 16.2 16.2			8A 11.0 10.9 10.8 10.7 10.6		
9A 32.6 32.6 32.6 32.6 32.6			9A 32.4 32.4 32.4 32.4 32.4			9A 16.2 16.2 16.2 16.2 16.2			9A 1.8 1.8 1.8 1.8 1.8		
10A 32.6			10A 25.7			10A 13.7			10A 0.7		
PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE		
100	2	4	100	2	4	100	2	4	100	2	4
1A 25.6 25.6 25.6 25.6 25.6			1A 39.3 39.3 39.3 39.3 39.3			1A 16.6 16.6 16.6 16.6 16.6			1A 15.0 15.0 15.0 15.0 15.0		
2A 25.6 25.6 25.6 25.6 25.6			2A 39.2 39.2 39.2 39.2 39.2			2A 14.2 14.2 14.2 14.2 14.2			2A 14.3 14.3 14.3 14.3 14.3		
3A 25.6 25.6 25.6 25.6 25.6			3A 39.2 39.2 39.2 39.2 39.2			3A 13.4 13.4 13.4 13.4 13.4			3A 0.2 0.3 0.3 0.3 0.3		
4A 25.6 25.6 25.6 25.6 25.6			4A 39.2 39.2 39.2 39.2 39.2			4A 13.4 13.4 13.4 13.4 13.4			4A 0.2 0.2 0.2 0.2 0.2		
5A 25.6 25.6 25.6 25.6 25.6			5A 38.3 38.3 38.3 38.3 38.3			5A 12.4 12.4 12.4 12.4 12.4			5A 0.1 0.1 0.1 0.1 0.1		
6A 25.6 25.6 25.6 25.6 25.6			6A 37.0 37.0 37.0 37.0 37.0			6A 11.5 11.5 11.5 11.5 11.5			6A 0.1 0.1 0.1 0.1 0.1		
7A 25.6 25.6 25.6 25.6 25.6			7A 34.5 34.5 34.5 34.5 34.5			7A 10.3 10.3 10.3 10.3 10.3			7A 0.1 0.1 0.1 0.1 0.1		
8A 25.6 25.6 25.6 25.6 25.6			8A 30.5 30.5 30.5 30.5 30.5			8A 9.3 9.3 9.3 9.3 9.3			8A 0.1 0.1 0.1 0.1 0.1		
9A 25.6 25.6 25.6 25.6 25.6			9A 24.7 24.7 24.7 24.7 24.7			9A 8.2 8.2 8.2 8.2 8.2			9A 0.1 0.1 0.1 0.1 0.1		
10A 25.6			10A 21.2			10A 0.1			10A 0.1		

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Table B6
Speed Profile for MISAR-MU98

Primary Roads		Secondary Roads		Trails		Off-Road	
PERCENT TOTAL DISTANCE		PERCENT TOTAL DISTANCE		PERCENT TOTAL DISTANCE		PERCENT TOTAL DISTANCE	
100	2	4	6	100	2	4	6
1	40.0	40.0	40.0	1	32.0	32.0	32.0
2	40.0	40.0	40.0	2	31.0	31.0	31.0
3	40.0	40.0	40.0	3	30.0	30.0	30.0
4	40.0	40.0	40.0	4	29.0	29.0	29.0
5	40.0	40.0	40.0	5	28.0	28.0	28.0
6	40.0	40.0	40.0	6	27.0	27.0	27.0
7	40.0	40.0	40.0	7	26.0	26.0	26.0
8	40.0	40.0	40.0	8	25.0	25.0	25.0
9	40.0	40.0	40.0	9	24.0	24.0	24.0
10	40.0	40.0	40.0	10	23.0	23.0	23.0
11	40.0	40.0	40.0	11	22.0	22.0	22.0
12	40.0	40.0	40.0	12	21.0	21.0	21.0
13	40.0	40.0	40.0	13	20.0	20.0	20.0
14	40.0	40.0	40.0	14	19.0	19.0	19.0
15	40.0	40.0	40.0	15	18.0	18.0	18.0
16	40.0	40.0	40.0	16	17.0	17.0	17.0
17	40.0	40.0	40.0	17	16.0	16.0	16.0
18	40.0	40.0	40.0	18	15.0	15.0	15.0
19	40.0	40.0	40.0	19	14.0	14.0	14.0
20	40.0	40.0	40.0	20	13.0	13.0	13.0
21	40.0	40.0	40.0	21	12.0	12.0	12.0
22	40.0	40.0	40.0	22	11.0	11.0	11.0
23	40.0	40.0	40.0	23	10.0	10.0	10.0
24	40.0	40.0	40.0	24	9.0	9.0	9.0
25	40.0	40.0	40.0	25	8.0	8.0	8.0
26	40.0	40.0	40.0	26	7.0	7.0	7.0
27	40.0	40.0	40.0	27	6.0	6.0	6.0
28	40.0	40.0	40.0	28	5.0	5.0	5.0
29	40.0	40.0	40.0	29	4.0	4.0	4.0
30	40.0	40.0	40.0	30	3.0	3.0	3.0
31	40.0	40.0	40.0	31	2.0	2.0	2.0
32	40.0	40.0	40.0	32	1.0	1.0	1.0
33	40.0	40.0	40.0	33	0.0	0.0	0.0
34	40.0	40.0	40.0	34	0.0	0.0	0.0
35	40.0	40.0	40.0	35	0.0	0.0	0.0
36	40.0	40.0	40.0	36	0.0	0.0	0.0
37	40.0	40.0	40.0	37	0.0	0.0	0.0
38	40.0	40.0	40.0	38	0.0	0.0	0.0
39	40.0	40.0	40.0	39	0.0	0.0	0.0
40	40.0	40.0	40.0	40	0.0	0.0	0.0

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Table E7
Speed Profile for M813-M204

Primary Roads			Secondary Roads			Trails			Off-Road		
PERCENT TOTAL DISTANCE			West Germany - Wet Condition			West Germany - Wet Condition			PERCENT TOTAL DISTANCE		
X=0	2	4	X=0	2	4	X=0	2	4	X=0	2	4
1X 50.0 50.0 50.0 50.0 50.0			1X 47.5 46.6 45.9 45.5 45.4			1X 35.0 36.4 29.2 28.4 28.1			1X 21.7 20.1 19.4 18.7 17.9		
1X 50.0 50.0 50.0 50.0 50.0			1X 45.2 44.8 44.5 44.2 44.0			1X 27.5 26.4 25.3 24.6 24.8			1X 17.3 16.9 16.6 16.4 16.1		
2X 50.0 50.0 50.0 50.0 50.0			2X 43.3 42.7 42.2 41.8 41.3			2X 23.6 23.1 22.7 22.3 22.8			2X 15.9 15.7 15.5 15.3 15.1		
3X 49.7 49.6 49.5 49.4 49.3			3X 40.9 40.5 40.2 39.8 39.4			3X 21.7 21.5 21.1 20.6 20.8			3X 14.9 14.8 14.7 14.6 14.4		
4X 49.1 48.9 48.7 48.4 48.1			4X 38.6 38.1 37.7 37.2 36.8			4X 19.3 18.8 18.3 17.9 17.5			4X 14.3 14.2 14.1 13.9 13.8		
5X 46.3 45.7 45.2 44.6 44.1			5X 36.7 36.2 35.7 35.2 34.6			5X 17.1 16.9 16.6 16.3 16.1			5X 13.7 13.5 13.4 13.3 13.1		
6X 43.6 43.2 42.8 42.4 42.0			6X 34.1 33.6 33.2 32.7 32.3			6X 15.0 15.7 15.5 15.4 15.2			6X 13.0 12.9 12.7 12.6 12.4		
7X 41.9 41.5 41.0 40.5 40.0			7X 31.9 31.5 31.0 30.5 29.9			7X 15.0 14.7 14.2 13.6 13.8			7X 12.3 12.1 11.8 11.6 11.4		
8X 37.9 36.9 35.9 34.9 33.8			8X 29.3 28.7 28.1 27.5 26.8			8X 12.5 12.1 11.7 11.3 11.0			8X 11.3 10.8 10.5 10.2 7.9		
9X 32.6 31.6 30.7 29.8 28.6			9X 26.2 25.6 25.0 24.3 23.4			9X 10.7 10.5 10.2 10.0 9.8			9X 9.6 4.8 2.4 1.6 1.2		
10X 27.4			10X 22.6			10X 3.9			10X 1.0		
PERCENT TOTAL DISTANCE			West Germany - Snow Condition			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE		
X=0	2	4	X=0	2	4	X=0	2	4	X=0	2	4
1X 16.9 16.0 15.9 15.6 15.0			1X 13.1 12.9 12.2 12.0 11.8			1X 10.6 10.5 10.3 10.4 10.4			1X 20.0 20.0 17.2 18.4 16.8		
2X 13.0 12.9 12.7 12.6 12.6			2X 11.7 11.7 11.6 11.6 11.6			2X 10.3 10.3 10.3 10.2 10.2			1X 14.4 13.2 12.4 11.9 11.5		
3X 12.5 12.4 12.4 12.3 12.3			3X 11.5 11.4 11.4 11.4 11.5			3X 9.9 9.9 9.8 9.8 9.8			2X 11.2 10.9 10.7 10.5 10.4		
4X 12.3 12.2 12.2 12.1 12.1			4X 11.3 11.3 11.2 11.2 11.2			4X 9.7 9.7 9.7 9.6 9.6			3X 10.2 10.1 10.0 9.9 9.8		
5X 12.1 12.1 12.0 12.0 12.0			5X 11.1 11.1 11.1 11.1 11.1			5X 9.5 9.5 9.4 9.4 9.4			4X 9.6 9.5 9.5 9.4 9.3		
6X 12.0 12.0 11.9 11.9 11.8			6X 11.0 11.0 11.0 11.0 10.9			6X 9.3 9.3 9.3 9.2 9.2			5X 9.2 9.2 9.1 9.0 9.0		
7X 11.8 11.7 11.7 11.7 11.6			7X 10.9 10.9 10.9 10.8 10.8			7X 9.1 9.1 8.9 8.7 8.5			6X 8.9 8.8 8.6 8.6 8.6		
8X 11.6 11.6 11.5 11.5 11.5			8X 10.8 10.8 10.7 10.7 10.7			8X 8.4 8.3 8.1 8.0 7.9			7X 8.5 8.4 8.3 8.2 8.2		
9X 11.4 11.4 11.3 11.3 11.2			9X 10.7 10.6 10.6 10.4 10.3			9X 7.8 7.7 7.6 7.5 7.5			8X 7.9 7.7 7.5 7.3 6.9		
10X 11.2			10X 7.5			10X 5.6			9X 2.8 1.8 1.3 1.1 0.9		
PERCENT TOTAL DISTANCE			Mid-East - Wet Condition			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE		
X=0	2	4	X=0	2	4	X=0	2	4	X=0	2	4
1X 47.7 47.7 47.7 47.7 47.7			1X 47.3 47.3 46.6 46.0 45.8			1X 30.4 30.2 29.3 28.5 28.2			1X 17.8 17.1 16.8 16.6 16.4		
2X 47.7 47.7 47.7 47.7 47.7			2X 45.6 45.5 45.4 45.4 45.3			2X 27.9 27.4 26.9 26.6 26.2			1X 16.1 15.8 15.6 15.3 15.8		
3X 46.9 46.7 46.6 46.5 46.4			3X 44.7 44.5 44.4 44.3 44.2			3X 25.5 24.9 24.4 24.1 23.8			2X 14.7 14.5 14.3 14.1 14.8		
4X 46.3 46.2 46.0 45.7 45.5			4X 44.1 44.0 43.8 43.7 43.3			4X 23.5 23.3 23.1 22.8 22.6			3X 13.8 13.7 13.5 13.2 13.2		
5X 45.3 45.0 44.7 44.4 44.1			5X 42.9 42.6 42.2 41.9 41.5			5X 19.6 19.1 18.7 18.3 18.0			4X 13.0 12.8 12.6 12.5 12.3		
6X 43.9 43.7 43.4 43.2 43.1			6X 41.2 40.9 40.4 40.0 39.7			6X 17.7 17.4 17.1 16.9 16.7			5X 12.1 11.9 11.6 11.4 11.2		
7X 42.9 42.7 42.5 42.3 41.9			7X 39.2 38.7 38.0 37.1 36.6			7X 16.5 16.3 16.1 15.9 15.8			6X 11.0 10.9 10.7 10.5 10.3		
8X 41.6 41.2 40.8 40.4 39.8			8X 35.6 34.1 32.8 31.6 30.6			8X 15.6 15.4 15.1 14.4 13.8			7X 10.0 9.7 9.5 9.3 9.1		
9X 38.9 37.4 35.1 33.1 31.3			9X 29.6 28.8 28.0 27.4 26.7			9X 13.3 12.9 12.4 12.1 11.7			8X 8.7 8.3 7.9 7.4 7.1		
10X 28.8			10X 25.9			10X 11.4			9X 3.9 2.1 1.5 1.2 1.1		
PERCENT TOTAL DISTANCE			Mid-East - Sand Condition			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE		
X=0	2	4	X=0	2	4	X=0	2	4	X=0	2	4
1X 47.7 47.7 47.7 47.7 47.7			1X 39.3 39.3 39.3 39.3 39.3			1X 13.1 13.0 13.0 12.9 12.7			1X 15.0 15.0 14.4 13.9 13.5		
2X 47.7 47.7 47.7 47.7 47.7			2X 39.3 39.3 39.3 39.3 39.3			2X 12.6 12.5 12.4 12.2 12.1			2X 15.0 14.1 13.1 12.1 11.8		
3X 46.9 46.7 46.6 46.5 46.4			3X 39.3 39.3 39.3 39.3 39.3			3X 12.0 11.9 11.7 11.6 11.5			3X 15.0 14.1 13.1 12.1 11.8		
4X 46.3 46.2 46.0 45.7 45.5			4X 39.3 39.2 38.9 38.6 38.3			4X 11.4 10.8 10.3 9.0 9.5			4X 15.0 14.1 13.1 12.1 11.8		
5X 45.2 44.9 44.6 44.3 44.1			5X 38.0 37.7 37.5 37.2 37.0			5X 9.1 7.9 1.4 1.0 0.7			5X 15.0 14.1 13.1 12.1 11.8		
6X 43.8 43.6 43.4 43.2 43.0			6X 36.7 36.4 35.9 35.3 34.8			6X 0.6 0.5 0.5 0.3 0.4			6X 15.0 14.1 13.1 12.1 11.8		
7X 42.8 42.7 42.4 42.1 41.8			7X 34.3 33.7 32.9 32.2 31.3			7X 0.4 0.3 0.3 0.2 0.2			7X 15.0 14.1 13.1 12.1 11.8		
8X 41.4 41.0 40.5 40.1 39.5			8X 30.3 28.8 27.6 26.5 25.5			8X 0.3 0.3 0.2 0.2 0.2			8X 15.0 14.1 13.1 12.1 11.8		
9X 38.4 36.9 34.6 32.6 30.7			9X 24.6 23.8 23.1 22.5 21.9			10X 0.2 0.2 0.2 0.2 0.2			9X 15.0 14.1 13.1 12.1 11.8		
10X 29.2			10X 21.1			10X 0.2			10X 15.0 14.1 13.1 12.1 11.8		

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Table E3

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Table E9
Speed Profile for M813-M198

Primary Roads			Secondary Roads			Trails			Off-Road		
PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE		
X=0	2	4	X=0	2	4	X=0	2	4	X=0	2	4
1X 43.0 43.0 43.0 43.0 43.0			1X 36.9 36.9 36.9 36.9 36.9			1X 25.3 25.3 25.3 25.3 25.3			1X 20.0 20.0 20.0 20.0 20.0		
2X 43.0 43.0 43.0 43.0 43.0			2X 35.1 35.1 35.1 35.1 35.1			2X 22.4 22.4 22.4 22.4 22.4			2X 16.1 16.1 16.1 16.1 16.1		
3X 43.0 43.0 43.0 43.0 43.0			3X 34.4 34.4 34.4 34.4 34.4			3X 20.8 20.8 20.8 20.8 20.8			3X 14.5 14.5 14.5 14.5 14.5		
4X 42.2 42.2 42.2 42.2 42.2			4X 33.8 33.8 33.8 33.8 33.8			4X 19.6 19.6 19.6 19.6 19.6			4X 12.6 12.6 12.6 12.6 12.6		
5X 40.4 39.9 39.9 39.9 39.9			5X 32.2 31.7 31.7 31.7 31.7			5X 17.2 16.8 16.8 16.8 16.8			5X 11.1 10.9 10.9 10.9 10.9		
6X 37.2 36.5 35.9 35.3 34.8			6X 29.7 29.3 29.3 29.3 29.3			6X 15.7 15.5 15.5 15.5 15.5			6X 11.1 10.9 10.9 10.9 10.9		
7X 34.3 33.0 33.4 33.0 32.4			7X 26.8 26.5 26.1 25.7 25.3			7X 14.8 14.6 14.6 14.6 14.6			7X 10.4 10.2 10.1 9.9 9.7		
8X 31.6 31.2 30.5 29.9 29.1			8X 24.9 24.4 24.0 23.6 23.2			8X 11.9 11.5 11.1 10.8 10.6			8X 9.5 9.2 8.9 8.7 8.4		
9X 28.3 27.7 27.0 26.4 25.5			9X 22.7 22.4 21.9 21.4 20.8			9X 10.3 10.1 9.9 9.7 9.5			9X 8.5 8.2 7.9 7.7 7.5		
10X 26.6			10X 20.2			10X 9.9			10X 7.5		
PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE		
X=0	2	4	X=0	2	4	X=0	2	4	X=0	2	4
1X 16.9 16.9 16.9 16.9 16.9			1X 13.1 12.5 11.0 10.6 10.4			1X 8.6 8.6 8.6 8.6 8.6			1X 20.0 20.0 20.0 20.0 20.0		
2X 14.3 14.0 13.3 12.2 11.4			2X 9.8 9.4 9.1 8.9 8.8			2X 8.6 8.6 8.6 8.6 8.6			2X 13.9 11.7 10.5 9.7 9.2		
3X 10.6 10.4 10.1 9.8 9.6			3X 8.6 8.5 8.4 8.4 8.3			3X 8.6 8.6 8.6 8.6 8.6			3X 8.8 8.5 8.3 8.1 7.9		
4X 8.0 8.7 8.6 8.6 8.5			4X 8.0 8.0 8.0 8.0 7.9			4X 8.6 8.6 8.6 8.6 8.6			4X 7.3 7.2 7.1 7.0 7.0		
5X 8.4 8.4 8.3 8.2 8.2			5X 7.9 7.9 7.9 7.8 7.8			5X 8.6 8.6 8.6 8.6 8.6			5X 6.9 6.8 6.8 6.7 6.6		
6X 8.1 8.1 8.1 8.0 8.0			6X 7.8 7.8 7.8 7.7 7.7			6X 8.6 8.6 8.6 8.6 8.6			6X 6.5 6.4 6.3 6.2 6.1		
7X 7.9 7.8 7.8 7.8 7.7			7X 7.7 7.7 7.6 7.6 7.6			7X 8.6 8.6 8.6 8.6 8.6			7X 5.9 5.8 5.8 5.7 5.7		
8X 7.7 7.6 7.6 7.6 7.5			8X 7.6 7.6 7.6 7.5 7.5			8X 8.6 8.6 8.6 8.6 8.6			8X 5.0 5.0 5.0 5.0 5.0		
9X 7.5 7.5 7.5 7.4 7.4			9X 7.5 7.5 7.5 7.4 7.4			9X 8.6 8.6 8.6 8.6 8.6			9X 4.5 4.5 4.5 4.5 4.5		
10X 7.4			10X 7.4			10X 8.6			10X 4.0		
PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE		
X=0	2	4	X=0	2	4	X=0	2	4	X=0	2	4
1X 41.0 41.0 41.0 41.0 41.0			1X 36.9 36.9 36.9 36.9 36.9			1X 25.3 25.3 25.3 25.3 25.3			1X 17.4 16.8 15.5 15.1 14.9		
2X 41.0 41.0 41.0 41.0 41.0			2X 35.2 35.1 35.1 35.1 35.1			2X 23.0 23.2 22.7 22.2 21.7			2X 14.7 14.5 14.3 14.0 13.7		
3X 39.9 39.7 39.5 39.3 39.1			3X 34.8 34.8 34.7 34.6 34.6			3X 21.3 20.9 20.6 20.4 20.2			3X 13.5 13.3 13.1 12.9 12.8		
4X 38.4 38.3 38.1 37.9 37.7			4X 34.5 34.5 34.5 34.4 34.4			4X 18.6 18.3 17.9 17.5 17.2			4X 11.9 11.7 11.5 11.3 11.1		
5X 37.6 37.4 37.3 37.2 37.1			5X 34.3 34.3 34.2 34.1 34.1			5X 16.9 16.6 16.4 16.1 15.9			5X 10.9 10.7 10.5 10.3 10.2		
6X 36.9 36.7 36.5 36.3 36.1			6X 33.7 33.4 33.2 32.9 32.7			6X 15.7 15.6 15.4 15.2 15.1			6X 10.0 9.8 9.7 9.5 9.4		
7X 35.9 35.7 35.5 35.3 35.1			7X 32.5 32.3 31.9 31.5 31.1			7X 15.0 14.8 14.7 14.5 14.4			7X 9.1 8.9 8.7 8.5 8.2		
8X 34.1 33.1 31.5 29.8 28.4			8X 30.5 29.5 28.6 27.8 27.0			8X 14.2 14.0 13.6 13.0 12.6			8X 7.9 7.5 7.2 6.9 6.6		
9X 27.2			9X 26.4 25.8 25.2 24.7 24.2			9X 12.2 11.8 11.5 11.2 10.9			9X 1.8 1.3 1.0 0.9 0.7		
			10X 23.6			10X 9.6			10X 0.7		
PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE		
X=0	2	4	X=0	2	4	X=0	2	4	X=0	2	4
1X 41.0 41.0 41.0 41.0 41.0			1X 36.9 36.9 36.9 36.9 36.9			1X 10.4 10.1 9.1 8.1 8.1			1X 13.9 13.0 15.0 1.2 0.1		
2X 41.0 41.0 41.0 41.0 41.0			2X 35.4 34.9 34.6 34.3 34.1			2X 9.1 9.1 9.1 9.1 9.1			2X 0.2 0.1 0.1 0.1 0.1		
3X 39.9 39.7 39.5 39.3 39.1			3X 33.5 33.5 33.3 33.4 33.4			3X 0.1 0.1 0.1 0.1 0.1			3X 0.1 0.1 0.1 0.1 0.1		
4X 39.6 38.8 38.7 38.6 38.5			4X 33.3 33.3 33.3 33.2 33.2			4X 0.1 0.1 0.1 0.1 0.1			4X 0.1 0.1 0.1 0.1 0.1		
5X 38.4 38.2 38.0 37.8 37.7			5X 33.1 32.9 32.7 32.5 32.3			5X 0.1 0.1 0.1 0.1 0.1			5X 0.1 0.1 0.1 0.1 0.1		
6X 37.5 37.4 37.3 37.1 37.0			6X 32.0 31.7 31.4 31.1 30.8			6X 0.1 0.1 0.1 0.1 0.1			6X 0.1 0.1 0.1 0.1 0.1		
7X 36.8 36.6 36.5 36.3 36.0			7X 30.4 30.1 29.5 29.0 28.4			7X 0.1 0.1 0.1 0.1 0.1			7X 0.1 0.1 0.1 0.1 0.1		
8X 35.8 35.6 35.3 34.9 34.5			8X 27.6 26.4 25.4 24.5 23.7			8X 0.1 0.1 0.1 0.1 0.1			8X 0.1 0.1 0.1 0.1 0.1		
9X 33.8 32.7 30.9 29.3 27.9			9X 23.8 22.3 21.7 21.2 20.7			9X 0.1 0.1 0.1 0.1 0.1			9X 0.1 0.1 0.1 0.1 0.1		
10X 26.7			10X 20.0			10X 0.1			10X 0.1		

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Table E10
Speed Profile for M

Primary Roads										Secondary Roads										Speed Profile for M113-PR10										Trails										OFF-Road									
West Germany - Wet Condition										West Germany - Snow Condition										West Germany - Wet Condition										West Germany - Snow Condition										West Germany - Wet Condition									
PERCENT TOTAL DISTANCE										PERCENT TOTAL DISTANCE										PERCENT TOTAL DISTANCE										PERCENT TOTAL DISTANCE										PERCENT TOTAL DISTANCE									
X=0										X=0										X=0										X=0										X=0									
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
1	2	3																																															

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PERCENT TOTAL DISTANCE	
$x=0$	2 4 6 8
1	20.0 20.0 17.9 16.0 15.3
17	16.0 15.6 15.2 14.6 14.3
33	14.2 13.9 13.6 13.1 13.0
50	12.6 12.4 12.4 12.2 11.8
67	11.9 11.7 11.6 11.5 11.3
83	11.2 11.1 11.0 10.9 10.8
100	10.7 10.6 10.5 10.4 10.2
78	10.1 9.9 9.8 9.6 9.4
88	9.2 9.0 8.7 8.4 8.2
98	6.2 2.7 1.7 1.3 1.0
99	0.6

	0	1	2	3	4	5	6	7	8
PERCENT TOTAL DISTANCE	20.6	23.9	17.2	16.4	10.8	10.8			
1X	13.0	11.0	10.4	9.6	6.1				
2X	8.7	8.4	8.2	8.0	7.5				
3X	7.6	7.5	7.4	7.3	7.2				
4X	7.1	7.0	6.9	6.8	6.7				
5X	6.6	6.5	6.4	6.2	6.1				
6X	6.0	5.8	5.6	5.3	5.1				
7X	2.7	1.0	1.1	1.6	3.7				
8X	0.6	0.6	0.5	0.5	3.4				
9A	0.4	0.4	0.4	0.5	0.3				

PERCENT TOTAL DISTANCE				
X=0	2	4	6	8
1	15.0	15.0	15.6	16.2
2	13.9	13.7	13.5	13.1
3	12.9	12.6	12.7	12.4
4	12.2	11.8	11.6	11.1
5	11.4	11.2	11.0	10.7
6	10.5	10.4	10.2	9.9
7	9.7	9.6	9.5	9.1
8	8.9	8.7	8.5	8.2
9	7.8	7.4	7.1	6.9
10	6.4	6.0	5.7	5.5

[illegible]

1000-230

Ε16

Table E13
Speed Profile for M656-YM198

[illegible]

Table E14
Speed Profile for TWP001-20204

Primary Roads				Secondary Roads				Trails				Off-Road			

Table E15

PERCENT TOTAL DISTANCE		x=11					
		2	4	6	8	10	12
20.0	20.4	17.4	14.5	14.5	14.5	14.5	14.5
15.6	15.1	14.6	14.2	14.2	14.2	14.2	14.2
13.6	13.3	13.1	12.9	12.9	12.9	12.9	12.9
12.6	12.5	12.3	12.2	12.2	12.2	12.2	12.2
11.6	11.8	11.7	11.6	11.6	11.6	11.6	11.6
11.4	11.3	11.2	11.1	11.1	11.1	11.1	11.1
10.6	10.9	10.8	10.7	10.7	10.7	10.7	10.7
10.5	11.5	10.4	10.3	10.3	10.3	10.3	10.3
10.1	11.0	9.9	9.8	9.8	9.8	9.8	9.8
9.3	9.1	8.9	8.9	8.9	8.9	8.9	8.9
1							

PERCENT TOTAL DISTANCE	
$x=0$	2 4 6
15.0	15.0
20.8	17.9
25.0	15.8
14.1	13.9
13.3	13.0
12.6	12.4
12.0	11.8
11.6	11.4
11.1	11.0
10.6	10.5
9.8	9.5
1.7	1.7

PURCHASER TOTAL DISTANCE	x=0	2	4	6
15.0	15.0	15.0	14.8	14.5
13.8	13.8	13.6	13.4	13.2
12.9	12.9	12.8	12.6	12.4
12.4	12.4	12.3	12.2	12.1
12.0	12.0	11.9	11.7	11.5
11.6	11.6	11.5	11.4	11.3
11.2	11.2	11.1	11.0	10.9
10.7	10.7	10.6	10.4	10.2
10.0	10.0	9.9	9.7	9.5
9.3	9.3	9.1	9.0	8.8
2.8				

PERCENT TOTAL DISTANCE	2	4	6
15.0	15.0	13.6	11.8
14.4	10.0	9.6	9.4
13.6	8.0	8.0	7.6
13.2	8.2	8.0	7.6
12.8	1.0	0.7	0.6
12.4	11.4	0.3	0.3
12.0	0.3	0.3	0.2
11.6	0.2	0.2	0.2
11.2	0.2	0.2	0.2

Speed Profile for TDW901-FH70

E21

Table E18
Speed Profile for TUNNEL-24(150 mm)

Primary Roads

PERCENT TOTAL DISTANCE				
X=0	2	4	6	8
1X 24.2	24.2	24.2	24.2	24.2
1X 24.2	24.2	24.2	24.2	24.2
2X 23.6	23.6	23.6	23.6	23.6
3X 23.7	23.7	23.6	23.6	23.6
4X 23.6	23.6	23.6	23.6	23.6
5X 23.8	23.8	23.6	23.6	23.6
6X 22.6	22.6	22.2	22.0	21.8
7X 21.7	21.5	21.2	21.1	21.1
8X 21.0	20.8	20.7	20.5	20.3
9X 20.8	19.8	19.6	19.3	18.9
10X 18.5				

Secondary Roads

PERCENT TOTAL DISTANCE				
X=0	2	4	6	8
1X 28.1	28.1	28.1	28.0	19.9
2X 18.0	18.0	18.0	18.0	19.7
3X 18.7	18.7	18.7	18.6	19.6
4X 18.5	18.5	18.4	18.3	19.2
5X 18.1	18.0	18.0	18.0	19.6
6X 18.0	18.0	18.0	18.0	19.6
7X 17.2	17.1	17.0	16.8	17.3
8X 16.6	16.5	16.4	16.2	16.1
9X 16.8	15.8	15.6	15.3	15.1
10X 14.8				

Trails

PERCENT TOTAL DISTANCE				
X=0	2	4	6	8
1X 15.3	15.3	15.2	15.2	15.2
2X 15.1	15.1	15.1	15.0	14.9
3X 14.8	14.7	14.6	14.5	14.5
4X 14.4	14.3	14.2	14.1	14.0
5X 13.9	13.8	13.8	13.7	13.6
6X 13.5	13.5	13.4	13.3	13.2
7X 13.2	13.1	13.0	12.8	12.6
8X 12.8	12.8	12.7	12.6	12.4
9X 12.5	12.4	12.4	12.3	12.1
10X 11.3				

PERCENT TOTAL DISTANCE				
X=0	2	4	6	8
1X 16.9	16.9	16.9	16.8	16.7
2X 16.3	16.3	16.2	16.2	16.1
3X 16.1	16.1	16.1	16.1	16.1
4X 15.9	15.8	15.8	15.7	15.6
5X 15.5	15.4	15.3	15.3	15.2
6X 15.1	15.0	14.9	14.8	14.8
7X 14.7	14.6	14.5	14.4	14.3
8X 14.2	14.1	13.9	13.8	13.6
9X 13.5	13.4	13.2	12.9	12.7
10X 12.4				

PERCENT TOTAL DISTANCE				
X=0	2	4	6	8
1X 16.5	16.5	16.5	16.4	16.4
2X 16.3	16.3	16.2	16.2	16.1
3X 16.1	16.1	16.1	16.1	16.1
4X 15.9	15.8	15.8	15.7	15.6
5X 15.5	15.4	15.3	15.3	15.2
6X 15.1	15.0	14.9	14.8	14.8
7X 14.7	14.6	14.5	14.4	14.3
8X 14.2	14.1	13.9	13.8	13.6
9X 13.5	13.4	13.2	12.9	12.7
10X 12.4				

PERCENT TOTAL DISTANCE				
X=0	2	4	6	8
1X 15.7	15.7	15.5	15.4	15.4
2X 15.4	15.3	15.3	15.2	15.2
3X 15.0	14.9	14.8	14.7	14.6
4X 14.5	14.5	14.4	14.3	14.2
5X 14.1	14.0	13.9	13.8	13.7
6X 13.6	13.5	13.5	13.4	13.3
7X 13.2	13.2	13.1	13.0	12.9
8X 12.8	12.8	12.7	12.6	12.5
9X 12.1	11.9	11.7	11.4	11.1
10X 10.4				

PERCENT TOTAL DISTANCE				
X=0	2	4	6	8
1X 24.2	24.2	24.2	24.2	24.2
2X 24.2	24.2	24.2	24.2	24.2
3X 24.1	24.1	24.1	24.1	24.1
4X 24.1	24.1	24.0	24.0	24.0
5X 23.9	23.9	23.8	23.7	23.6
6X 23.5	23.4	23.3	23.2	23.1
7X 23.0	22.9	22.8	22.7	22.6
8X 22.5	22.4	22.3	22.2	22.1
9X 21.9	21.6	21.6	20.4	19.9
10X 19.4				

PERCENT TOTAL DISTANCE				
X=0	2	4	6	8
1X 28.1	28.1	28.1	28.1	28.4
2X 28.0	28.0	28.0	28.0	28.0
3X 28.0	28.0	28.0	28.0	28.0
4X 28.0	28.0	28.0	28.0	28.0
5X 28.0	28.0	28.0	28.0	28.0
6X 28.0	28.0	28.0	28.0	28.0
7X 28.0	28.0	28.0	28.0	28.0
8X 28.0	28.0	28.0	28.0	28.0
9X 28.0	28.0	28.0	28.0	28.0
10X 28.0				

PERCENT TOTAL DISTANCE				
X=0	2	4	6	8
1X 15.3	15.3	15.2	15.2	15.2
2X 15.1	15.1	15.1	15.1	15.0
3X 14.8	14.7	14.6	14.5	14.5
4X 14.4	14.3	14.2	14.1	14.0
5X 14.2	14.1	14.1	14.0	13.9
6X 13.9	13.8	13.8	13.7	13.6
7X 13.6	13.5	13.5	13.4	13.3
8X 13.2	13.2	13.1	13.0	12.9
9X 12.6	12.6	12.5	12.4	12.3
10X 11.4				

PERCENT TOTAL DISTANCE				
X=0	2	4	6	8
1X 24.2	24.2	24.2	24.2	24.2
2X 24.2	24.2	24.2	24.2	24.2
3X 24.1	24.1	24.1	24.1	24.1
4X 24.1	24.1	24.0	24.0	24.0
5X 23.9	23.9	23.8	23.7	23.6
6X 23.5	23.4	23.3	23.2	23.1
7X 23.0	22.9	22.8	22.7	22.6
8X 22.5	22.4	22.3	22.2	22.1
9X 21.9	21.6	21.6	20.4	19.9
10X 19.2				

PERCENT TOTAL DISTANCE				
X=0	2	4	6	8
1X 19.9	19.9	19.9	19.9	19.8
2X 19.6	19.6	19.6	19.6	19.6
3X 19.7	19.7	19.7	19.7	19.7
4X 19.6	19.6	19.6	19.6	19.6
5X 19.6	19.5	19.5	19.5	19.5
6X 19.4	19.4	19.4	19.3	19.3
7X 19.1	19.0	18.9	18.9	18.7
8X 18.5	18.1	17.8	17.4	17.1
9X 16.8	16.6	16.3	16.1	15.9
10X 15.6				

PERCENT TOTAL DISTANCE				
X=0	2	4	6	8
1X 18.3	18.3	18.1	18.1	18.1
2X 18.1	18.1	18.1	18.1	18.1
3X 18.1	18.1	18.1	18.1	18.1
4X 18.1	18.1	18.1	18.1	18.1
5X 18.1	18.1	18.1	18.1	18.1
6X 18.1	18.1	18.1	18.1	18.1
7X 18.1	18.1	18.1	18.1	18.1
8X 18.1	18.1	18.1	18.1	18.1
9X 18.1	18.1	18.1	18.1	18.1
10X 18.1				

E22

Table E19
Speed Profile for M520E1-M204

Primary Roads

Secondary Roads

Trails

Off-Road

West Germany - Wet Condition

PERCENT TOTAL DISTANCE

PERCENT TOTAL DISTANCE

PERCENT TOTAL DISTANCE

PERCENT TOTAL DISTANCE

X=0 2 4 6 8
X 28.8 28.8 28.8 28.8 28.8
1X 28.8 28.8 28.8 28.8 28.8
2X 28.8 28.8 28.8 28.8 28.8
3X 28.8 28.8 28.8 28.8 28.8
4X 28.8 28.8 28.8 28.8 28.8
5X 28.8 28.8 28.8 28.8 28.8
6X 28.8 28.8 28.8 28.8 28.8
7X 28.8 28.8 28.8 28.8 28.8
8X 28.8 28.8 28.8 28.8 28.8
9X 28.8 28.8 28.8 28.8 28.8
10X 28.8

X=0 2 4 6 8
X 26.8 26.5 26.0 25.8 25.7
1X 25.6 25.4 25.0 24.7 24.4
2X 24.1 23.8 23.6 23.4 23.3
3X 22.2 22.0 22.8 22.6 22.4
4X 22.3 22.1 21.9 21.7 21.5
5X 21.3 21.1 20.9 20.7 20.5
6X 20.3 20.1 19.9 19.7 19.6
7X 19.4 19.2 19.0 18.8 18.6
8X 18.4 18.2 18.0 17.8 17.7
9X 17.5 17.2 17.0 16.7 16.4
10X 16.0

X=0 2 4 6 8
X 28.0 28.0 17.2 16.4 16.0
1X 15.2 14.4 13.7 13.2 12.7
2X 12.4 12.1 11.9 11.5 11.3
3X 11.1 10.9 10.8 10.4 10.5
4X 10.4 10.2 10.1 10.0 9.8
5X 9.7 9.6 9.4 9.3 9.2
6X 9.0 8.9 8.8 8.7 8.5
7X 8.4 8.2 8.1 7.9 7.8
8X 7.6 7.4 7.2 7.0 6.8
9X 6.6 6.3 6.1 5.7 5.7
10X 1.0

West Germany - Snow Condition

PERCENT TOTAL DISTANCE

PERCENT TOTAL DISTANCE

PERCENT TOTAL DISTANCE

PERCENT TOTAL DISTANCE

X=0 2 4 6 8
X 14.9 16.9 16.9 16.8 16.7
1X 14.6 16.4 16.4 16.3 16.4
2X 16.2 16.2 16.1 16.1 16.1
3X 16.3 16.3 16.3 16.3 16.3
4X 16.3 16.3 16.3 16.3 16.3
5X 16.2 16.2 16.2 16.2 16.2
6X 16.2 16.2 16.2 16.2 16.2
7X 15.8 15.7 15.6 15.5 15.5
8X 15.4 15.3 15.2 15.2 15.1
9X 15.0 15.0 14.9 14.8 14.6
10X 14.4

X=0 2 4 6 8
X 15.7 14.8 14.6 14.3 14.1
1X 14.0 13.6 13.3 13.1 12.9
2X 12.7 12.6 12.3 12.2 12.0
3X 11.8 11.7 11.5 11.4 11.2
4X 10.9 10.7 10.5 10.4 10.2
5X 10.1 10.0 9.9 9.7 9.6
6X 9.5 9.4 9.3 9.2 9.1
7X 9.0 8.9 8.8 8.7 8.6
8X 8.5 8.4 8.4 8.3 8.2
9X 8.1 8.1 8.0 7.9 7.8
10X 7.7

X=0 2 4 6 8
X 20.0 20.0 17.2 16.4 16.0
1X 15.0 14.2 13.6 13.0 12.6
2X 12.2 11.9 11.6 11.3 11.1
3X 10.9 10.8 10.6 10.5 10.4
4X 10.2 10.1 10.0 9.9 9.7
5X 9.6 9.5 9.3 9.2 9.1
6X 8.9 8.8 8.7 8.5 8.4
7X 8.3 8.1 8.0 7.9 7.7
8X 7.5 7.3 7.2 7.0 6.8
9X 6.6 6.4 6.1 5.8 5.5
10X 2.1

Mid-East - Wet Condition

PERCENT TOTAL DISTANCE

PERCENT TOTAL DISTANCE

PERCENT TOTAL DISTANCE

PERCENT TOTAL DISTANCE

X=0 2 4 6 8
X 28.2 28.2 28.2 28.2 28.2
1X 28.2 28.2 28.2 28.2 28.2
2X 28.2 28.2 28.2 28.2 28.2
3X 28.2 28.2 28.2 28.2 28.2
4X 28.2 28.2 28.2 28.2 28.2
5X 28.2 28.2 28.2 28.2 28.2
6X 28.2 28.2 28.2 28.2 28.2
7X 28.2 28.2 28.2 28.2 28.2
8X 28.2 28.2 28.2 28.2 28.2
9X 28.2 28.2 28.2 28.2 28.2
10X 28.2

X=0 2 4 6 8
X 26.8 26.8 26.8 26.4 26.1
1X 26.0 25.9 25.8 25.8 25.7
2X 25.7 25.7 25.6 25.6 25.6
3X 25.4 25.2 24.9 24.7 24.5
4X 24.3 24.2 24.1 23.9 23.8
5X 23.7 23.6 23.5 23.5 23.4
6X 23.3 23.2 23.1 23.0 22.9
7X 22.8 22.6 22.4 22.2 22.1
8X 21.9 21.5 21.1 20.8 20.5
9X 20.3 20.0 19.8 19.5 19.3
10X 19.0

X=0 2 4 6 8
X 15.0 15.0 14.3 13.1 12.4
1X 11.8 11.5 11.2 11.1 10.9
2X 10.7 10.5 10.1 9.4 9.3
3X 9.8 9.6 9.4 9.3 9.1
4X 9.0 8.9 8.8 8.7 8.6
5X 8.3 8.2 8.2 8.1 7.9
6X 7.7 7.6 7.6 7.5 7.4
7X 7.3 7.2 7.2 7.1 7.0
8X 6.6 6.3 6.3 6.1 5.8
9X 5.4 5.2 5.1 4.8 4.6
10X 2.8

Mid-East - Sand Condition

PERCENT TOTAL DISTANCE

PERCENT TOTAL DISTANCE

PERCENT TOTAL DISTANCE

PERCENT TOTAL DISTANCE

X=0 2 4 6 8
X 28.2 28.2 28.2 28.2 28.2
1X 28.2 28.2 28.2 28.2 28.2
2X 28.2 28.2 28.2 28.2 28.2
3X 28.2 28.2 28.2 28.2 28.2
4X 28.2 28.2 28.2 28.2 28.2
5X 28.2 28.2 28.2 28.2 28.2
6X 28.2 28.2 28.2 28.2 28.2
7X 28.2 28.2 28.2 28.2 28.2
8X 28.2 28.2 28.2 28.2 28.2
9X 28.2 28.2 28.2 28.2 28.2
10X 28.2

X=0 2 4 6 8
X 26.8 26.8 26.5 26.1 25.9
1X 25.8 25.8 25.7 25.7 25.6
2X 25.6 25.6 25.6 25.4 25.1
3X 24.8 24.6 24.4 24.2 24.1
4X 23.9 23.8 23.7 23.6 23.5
5X 23.4 23.3 23.2 23.1 23.0
6X 22.9 22.8 22.7 22.5 22.3
7X 22.2 22.0 21.8 21.7 21.5
8X 21.1 20.6 20.0 19.6 19.1
9X 18.7 18.4 18.0 17.7 17.4
10X 17.0

X=0 2 4 6 8
X 15.0 15.0 13.2 12.6 12.4
1X 9.1 8.6 8.3 8.0 7.9
2X 7.6 7.4 7.3 7.2 7.1
3X 7.0 6.9 6.8 6.7 6.6
4X 6.5 6.4 6.4 6.3 6.2
5X 6.1 6.0 5.9 5.8 5.6
6X 5.4 5.3 5.3 5.2 5.0
7X 4.8 4.4 4.2 4.2 4.2
8X 1.5 1.1 0.9 0.9 0.9
9X 0.6 0.5 0.5 0.5 0.4
10X 0.4

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File for W52081-24198

E24

Trails

E25

Drills

[illegible]

DEPTH-TOTAL DISTANCE	1-2	2-4	4-6
1	16.9	16.9	15.6
1K	14.3	14.9	13.4
2	11.9	11.6	11.4
2K	11.9	11.6	11.4
3	16.9	16.8	16.7
3K	16.9	16.8	16.7
4	18.3	18.2	18.1
4K	18.3	18.2	18.1
5	18.1	18.1	18.0
5K	18.1	18.1	18.0
6	9.9	9.9	9.8
6K	9.9	9.9	9.8
7	9.7	9.7	9.7
7K	9.7	9.7	9.7
8	9.6	9.6	9.6
8K	9.6	9.6	9.6
9	9.5		
9K	9.5		

[illegible]

	PERCENT TOTAL DISTANCE					
	0	2	4	6	8	10
1	29.6	29.6	29.6	29.6	29.6	29.6
2	29.6	29.6	29.6	29.6	29.6	29.6
3	29.6	29.6	29.6	29.6	29.6	29.6
4	29.6	29.6	29.6	29.6	29.6	29.6
5	29.6	29.6	29.6	29.6	29.6	29.6
6	29.6	29.6	29.6	29.6	29.6	29.6
7	29.6	29.6	29.6	29.6	29.6	29.6
8	29.6	29.6	29.6	29.6	29.6	29.6
9	29.6	29.6	29.6	29.6	29.6	29.6
10	29.6	29.6	29.6	29.6	29.6	29.6
11	29.6	29.6	29.6	29.6	29.6	29.6
12	29.6	29.6	29.6	29.6	29.6	29.6
13	29.6	29.6	29.6	29.6	29.6	29.6
14	29.6	29.6	29.6	29.6	29.6	29.6
15	29.6	29.6	29.6	29.6	29.6	29.6
16	29.6	29.6	29.6	29.6	29.6	29.6
17	29.6	29.6	29.6	29.6	29.6	29.6
18	29.6	29.6	29.6	29.6	29.6	29.6
19	29.6	29.6	29.6	29.6	29.6	29.6
20	29.6	29.6	29.6	29.6	29.6	29.6
21	29.6	29.6	29.6	29.6	29.6	29.6
22	29.6	29.6	29.6	29.6	29.6	29.6
23	29.6	29.6	29.6	29.6	29.6	29.6
24	29.6	29.6	29.6	29.6	29.6	29.6
25	29.6	29.6	29.6	29.6	29.6	29.6
26	29.6	29.6	29.6	29.6	29.6	29.6
27	29.6	29.6	29.6	29.6	29.6	29.6
28	29.6	29.6	29.6	29.6	29.6	29.6
29	29.6	29.6	29.6	29.6	29.6	29.6
30	29.6	29.6	29.6	29.6	29.6	29.6
31	29.6	29.6	29.6	29.6	29.6	29.6
32	29.6	29.6	29.6	29.6	29.6	29.6
33	29.6	29.6	29.6	29.6	29.6	29.6
34	29.6	29.6	29.6	29.6	29.6	29.6
35	29.6	29.6	29.6	29.6	29.6	29.6
36	29.6	29.6	29.6	29.6	29.6	29.6
37	29.6	29.6	29.6	29.6	29.6	29.6
38	29.6	29.6	29.6	29.6	29.6	29.6
39	29.6	29.6	29.6	29.6	29.6	29.6
40	29.6	29.6	29.6	29.6	29.6	29.6
41	29.6	29.6	29.6	29.6	29.6	29.6
42	29.6	29.6	29.6	29.6	29.6	29.6
43	29.6	29.6	29.6	29.6	29.6	29.6
44	29.6	29.6	29.6	29.6	29.6	29.6
45	29.6	29.6	29.6	29.6	29.6	29.6
46	29.6	29.6	29.6	29.6	29.6	29.6
47	29.6	29.6	29.6	29.6	29.6	29.6
48	29.6	29.6	29.6	29.6	29.6	29.6
49	29.6	29.6	29.6	29.6	29.6	29.6
50	29.6	29.6	29.6	29.6	29.6	29.6
51	29.6	29.6	29.6	29.6	29.6	29.6
52	29.6	29.6	29.6	29.6	29.6	29.6
53	29.6	29.6	29.6	29.6	29.6	29.6
54	29.6	29.6	29.6	29.6	29.6	29.6
55	29.6	29.6	29.6	29.6	29.6	29.6
56	29.6	29.6	29.6	29.6	29.6	29.6
57	29.6	29.6	29.6	29.6	29.6	29.6
58	29.6	29.6	29.6	29.6	29.6	29.6
59	29.6	29.6	29.6	29.6	29.6	29.6
60	29.6	29.6	29.6	29.6	29.6	29.6
61	29.6	29.6	29.6	29.6	29.6	29.6
62	29.6	29.6	29.6	29.6	29.6	29.6
63	29.6	29.6	29.6	29.6	29.6	29.6
64	29.6	29.6	29.6	29.6	29.6	29.6
65	29.6	29.6	29.6	29.6	29.6	29.6
66	29.6	29.6	29.6	29.6	29.6	29.6
67	29.6	29.6	29.6	29.6	29.6	29.6
68	29.6	29.6	29.6	29.6	29.6	29.6
69	29.6	29.6	29.6	29.6	29.6	29.6
70	29.6	29.6	29.6	29.6	29.6	29.6
71	29.6	29.6	29.6	29.6	29.6	29.6
72	29.6	29.6	29.6	29.6	29.6	29.6
73	29.6	29.6	29.6	29.6	29.6	29.6
74	29.6	29.6	29.6	29.6	29.6	29.6
75	29.6	29.6	29.6	29.6	29.6	29.6
76	29.6	29.6	29.6	29.6	29.6	29.6
77	29.6	29.6	29.6	29.6	29.6	29.6
78	29.6	29.6	29.6	29.6	29.6	29.6
79	29.6	29.6	29.6	29.6	29.6	29.6
80	29.6	29.6	29.6	29.6	29.6	29.6
81	29.6	29.6	29.6	29.6	29.6	29.6
82	29.6	29.6	29.6	29.6	29.6	29.6
83	29.6	29.6	29.6	29.6	29.6	29.6
84	29.6	29.6	29.6	29.6	29.6	29.6
85	29.6	29.6	29.6	29.6	29.6	29.6
86	29.6	29.6	29.6	29.6	29.6	29.6
87	29.6	29.6	29.6	29.6	29.6	29.6
88	29.6	29.6	29.6	29.6	29.6	29.6
89	29.6	29.6	29.6	29.6	29.6	29.6
90	29.6	29.6	29.6	29.6	29.6	29.6
91	29.6	29.6	29.6	29.6	29.6	29.6
92	29.6	29.6	29.6	29.6	29.6	29.6
93	29.6	29.6	29.6	29.6	29.6	29.6
94	29.6	29.6	29.6	29.6	29.6	29.6
95	29.6	29.6	29.6	29.6	29.6	29.6
96	29.6	29.6	29.6	29.6	29.6	29.6
97	29.6	29.6	29.6	29.6	29.6	29.6
98	29.6	29.6	29.6	29.6	29.6	29.6
99	29.6	29.6	29.6	29.6	29.6	29.6
100	29.6	29.6	29.6	29.6	29.6	29.6

Year	2	4	A
1979	27.9	27.9	27.9
1978	27.9	27.9	27.9
1977	27.9	27.9	27.9
1976	27.9	27.9	27.9
1975	27.9	27.9	27.9
1974	27.9	27.9	27.9
1973	27.9	27.9	27.9
1972	27.9	27.9	27.9
1971	27.9	27.9	27.9
1970	27.9	27.9	27.9
1969	27.9	27.9	27.9
1968	27.9	27.9	27.9
1967	27.9	27.9	27.9
1966	27.9	27.9	27.9
1965	27.9	27.9	27.9
1964	27.9	27.9	27.9
1963	27.9	27.9	27.9
1962	27.9	27.9	27.9
1961	27.9	27.9	27.9
1960	27.9	27.9	27.9
1959	27.9	27.9	27.9
1958	27.9	27.9	27.9
1957	27.9	27.9	27.9
1956	27.9	27.9	27.9
1955	27.9	27.9	27.9
1954	27.9	27.9	27.9
1953	27.9	27.9	27.9
1952	27.9	27.9	27.9
1951	27.9	27.9	27.9
1950	27.9	27.9	27.9
1949	27.9	27.9	27.9
1948	27.9	27.9	27.9
1947	27.9	27.9	27.9
1946	27.9	27.9	27.9
1945	27.9	27.9	27.9
1944	27.9	27.9	27.9
1943	27.9	27.9	27.9
1942	27.9	27.9	27.9
1941	27.9	27.9	27.9
1940	27.9	27.9	27.9
1939	27.9	27.9	27.9
1938	27.9	27.9	27.9
1937	27.9	27.9	27.9
1936	27.9	27.9	27.9
1935	27.9	27.9	27.9
1934	27.9	27.9	27.9
1933	27.9	27.9	27.9
1932	27.9	27.9	27.9
1931	27.9	27.9	27.9
1930	27.9	27.9	27.9
1929	27.9	27.9	27.9
1928	27.9	27.9	27.9
1927	27.9	27.9	27.9
1926	27.9	27.9	27.9
1925	27.9	27.9	27.9
1924	27.9	27.9	27.9
1923	27.9	27.9	27.9
1922	27.9	27.9	27.9
1921	27.9	27.9	27.9
1920	27.9	27.9	27.9
1919	27.9	27.9	27.9
1918	27.9	27.9	27.9
1917	27.9	27.9	27.9
1916	27.9	27.9	27.9
1915	27.9	27.9	27.9
1914	27.9	27.9	27.9
1913	27.9	27.9	27.9
1912	27.9	27.9	27.9
1911	27.9	27.9	27.9
1910	27.9	27.9	27.9
1909	27.9	27.9	27.9
1908	27.9	27.9	27.9
1907	27.9	27.9	27.9
1906	27.9	27.9	27.9
1905	27.9	27.9	27.9
1904	27.9	27.9	27.9
1903	27.9	27.9	27.9
1902	27.9	27.9	27.9
1901	27.9	27.9	27.9
1900	27.9	27.9	27.9

[illegible]

$x=0$	2	4	6
27.9	27.9	27.9	27.9
27.9	27.9	27.9	27.9
27.9	27.9	27.9	27.9
27.9	27.9	27.9	27.9
27.9	27.9	27.9	27.9
27.8	27.6	27.7	27.6
27.5	27.4	27.3	27.2
27.1	27.8	26.9	26.7
26.5	26.4	26.2	26.1
25.3	24.9	24.4	23.9
23.0	22.6	22.2	21.9
21.1			

Time	0.0	0.1	0.2	0.4	0.6
1	27.6	27.6	27.6	27.6	27.6
2	27.6	27.6	27.6	27.6	27.6
3	27.6	27.6	27.6	27.6	27.6
4	27.6	27.6	27.6	27.6	27.6
5	27.6	27.6	27.6	27.6	27.6
6	27.6	27.6	27.6	27.6	27.6
7	27.6	27.6	27.6	27.6	27.6
8	27.6	27.6	27.6	27.6	27.6
9	27.6	27.6	27.6	27.6	27.6
10	27.6	27.6	27.6	27.6	27.6
11	27.6	27.6	27.6	27.6	27.6
12	27.6	27.6	27.6	27.6	27.6
13	27.6	27.6	27.6	27.6	27.6
14	27.6	27.6	27.6	27.6	27.6
15	27.6	27.6	27.6	27.6	27.6
16	27.6	27.6	27.6	27.6	27.6
17	27.6	27.6	27.6	27.6	27.6
18	27.6	27.6	27.6	27.6	27.6
19	27.6	27.6	27.6	27.6	27.6
20	27.6	27.6	27.6	27.6	27.6
21	27.6	27.6	27.6	27.6	27.6
22	27.6	27.6	27.6	27.6	27.6
23	27.6	27.6	27.6	27.6	27.6
24	27.6	27.6	27.6	27.6	27.6
25	27.6	27.6	27.6	27.6	27.6
26	27.6	27.6	27.6	27.6	27.6
27	27.6	27.6	27.6	27.6	27.6
28	27.6	27.6	27.6	27.6	27.6
29	27.6	27.6	27.6	27.6	27.6
30	27.6	27.6	27.6	27.6	27.6
31	27.6	27.6	27.6	27.6	27.6
32	27.6	27.6	27.6	27.6	27.6
33	27.6	27.6	27.6	27.6	27.6
34	27.6	27.6	27.6	27.6	27.6
35	27.6	27.6	27.6	27.6	27.6
36	27.6	27.6	27.6	27.6	27.6
37	27.6	27.6	27.6	27.6	27.6
38	27.6	27.6	27.6	27.6	27.6
39	27.6	27.6	27.6	27.6	27.6
40	27.6	27.6	27.6	27.6	27.6
41	27.6	27.6	27.6	27.6	27.6
42	27.6	27.6	27.6	27.6	27.6
43	27.6	27.6	27.6	27.6	27.6
44	27.6	27.6	27.6	27.6	27.6
45	27.6	27.6	27.6	27.6	27.6
46	27.6	27.6	27.6	27.6	27.6
47	27.6	27.6	27.6	27.6	27.6
48	27.6	27.6	27.6	27.6	27.6
49	27.6	27.6	27.6	27.6	27.6
50	27.6	27.6	27.6	27.6	27.6
51	27.6	27.6	27.6	27.6	27.6
52	27.6	27.6	27.6	27.6	27.6
53	27.6	27.6	27.6	27.6	27.6
54	27.6	27.6	27.6	27.6	27.6
55	27.6	27.6	27.6	27.6	27.6
56	27.6	27.6	27.6	27.6	27.6
57	27.6	27.6	27.6	27.6	27.6
58	27.6	27.6	27.6	27.6	27.6
59	27.6	27.6	27.6	27.6	27.6
60	27.6	27.6	27.6	27.6	27.6
61	27.6	27.6	27.6	27.6	27.6
62	27.6	27.6	27.6	27.6	27.6

NO.	PERCENT	TOTAL	DISPERG.
100	10.0	2	4.7
101	10.1	10.6	10.4
102	10.3	10.7	10.8
103	10.5	10.8	11.1
104	10.7	11.0	11.4
105	10.9	11.2	11.7
106	11.1	11.4	12.0
107	11.3	11.6	12.3
108	11.5	11.8	12.6
109	11.7	12.0	12.9
110	11.9	12.2	13.2
111	12.1	12.4	13.5
112	12.3	12.6	13.8
113	12.5	12.8	14.1
114	12.7	13.0	14.4
115	12.9	13.2	14.7
116	13.1	13.4	15.0
117	13.3	13.6	15.3
118	13.5	13.8	15.6
119	13.7	14.0	15.9
120	13.9	14.2	16.2
121	14.1	14.4	16.5
122	14.3	14.6	16.8
123	14.5	14.8	17.1
124	14.7	15.0	17.4
125	14.9	15.2	17.7
126	15.1	15.4	18.0
127	15.3	15.6	18.3
128	15.5	15.8	18.6
129	15.7	16.0	18.9
130	15.9	16.2	19.2
131	16.1	16.4	19.5
132	16.3	16.6	19.8
133	16.5	16.8	20.1
134	16.7	17.0	20.4
135	16.9	17.2	20.7
136	17.1	17.4	21.0
137	17.3	17.6	21.3
138	17.5	17.8	21.6
139	17.7	18.0	21.9
140	17.9	18.2	22.2
141	18.1	18.4	22.5
142	18.3	18.6	22.8
143	18.5	18.8	23.1
144	18.7	19.0	23.4
145	18.9	19.2	23.7
146	19.1	19.4	24.0
147	19.3	19.6	24.3
148	19.5	19.8	24.6
149	19.7	20.0	24.9
150	19.9	20.2	25.2

	2	4	6
RECEIPT TOTAL DISTANCE	0.7	0.6	0.5
X80	0.5	0.5	0.5
	0.4	0.4	0.4
	0.4	0.4	0.4
	0.3	0.3	0.3
	0.3	0.2	0.2
	0.3	0.2	0.1
	0.1	0.1	0.1
	0.0	0.0	0.0
	0.9	0.8	0.8
	7.7	7.7	7.7
	7.7	7.6	7.6
	7.4	7.3	7.2
	3.3		
	3.3		

	x=9	x=8	x=7	x=6	x=5	x=4	x=3	x=2	x=1	
PERCENT TOTAL DISTANCE	11.0	12.5	12.2	12.4	11.8	1	1	1	1	1
	13.6	13.5	13.1	13.0	1	1	1	1	1	1
	15.8	14.9	14.8	14.7	1	1	1	1	1	1
	15.6	15.5	15.4	15.3	1	1	1	1	1	1
	16.3	14.2	14.6	15.9	1	1	1	1	1	1
	17.1	17.8	16.8	16.7	1	1	1	1	1	1
	17.7	17.6	17.5	17.4	1	1	1	1	1	1
	18.2	18.1	18.1	18.0	1	1	1	1	1	1
	18.8	18.6	18.4	18.3	1	1	1	1	1	1

PERCENT TOTAL INSTANT	2	4	6
x=0			
6.0	0.1	0.1	0.1
5.0	0.1	0.1	0.1
4.0	0.1	0.1	0.1
3.0	0.1	0.1	0.1
2.0	0.1	0.1	0.1
1.0	0.1	0.1	0.1
0.1	0.1	0.1	0.1

Project	Initial	Adjusted
X-20	20.0	17.4
X-21	20.0	15.6
X-22	15.0	14.5
X-23	13.5	12.8
X-24	12.5	11.7
X-25	11.4	11.1
X-26	10.7	10.5
X-27	10.2	10.0
X-28	9.6	9.2
X-29	8.6	8.3
X-30	5.2	2.5
X-31	1.0	1.7

PERCENT TOTAL DISTANCE	1	2	3	4	5
1	12.0	28.6	17.2	18.5	16.0
2	13.1	12.6	17.2	18.5	10.5
3	13.1	9.0	9.0	9.4	9.2
4	9.1	9.0	0.0	0.7	0.6
5	0.5	8.4	8.4	0.3	0.2
6	1.8	2.1	8.0	8.0	7.9
7	7.6	7.7	7.7	7.6	7.5
8	7.4	7.5	7.2	7.1	7.0
9	6.9	6.7	6.2	3.5	2.0
10	1.4	1.1	0.9	0.0	0.7
11	0.0				

PERCENT TOTAL DISTRICT	1	2	3	4	5	6
15.0	15.0	15.0	15.0	14.5	13.0	
13.5	13.5	13.1	12.9	12.7		
12.4	12.4	12.2	12.1	12.0		
11.9	11.7	11.6	11.5	11.3		
11.1	11.0	10.8	10.7	10.5		
10.4	10.3	10.1	10.0	9.8		
9.5	9.5	9.4	9.3	9.1		
8.9	8.9	8.7	8.6	8.4		
8.2	8.0	7.8	7.5	7.2		
5.6	2.6	1.7	1.3	1.0		
0.9						

[illegible]

Primary Roads

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
X 40.0	40.0	40.0	40.0	40.0
1X 40.0	40.0	40.0	40.0	40.0
2X 40.0	40.0	40.0	40.0	40.0
3X 40.0	40.0	40.0	40.0	40.0
4X 40.0	40.0	40.0	40.0	40.0
5X 39.9	39.7	39.4	39.0	38.7
6X 38.3	38.1	37.8	37.5	37.3
7X 37.1	36.8	36.4	36.0	35.4
8X 34.6	33.8	33.1	32.3	31.3
9X 30.4	29.6	28.8	28.0	27.0
10X 25.9				

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
X 40.0	40.0	40.0	40.0	40.0
1X 40.0	40.0	40.0	40.0	40.0
2X 40.0	40.0	40.0	40.0	40.0
3X 40.0	40.0	40.0	40.0	40.0
4X 40.0	40.0	40.0	40.0	40.0
5X 39.0	38.8	38.7	38.5	38.3
6X 37.1	36.8	36.4	36.0	35.4
7X 33.2	32.4	31.4	30.4	29.4
8X 30.5	29.6	28.7	27.9	26.8
10X 25.7				

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
X 40.0	40.0	40.0	40.0	40.0
1X 40.0	40.0	40.0	40.0	40.0
2X 40.0	40.0	40.0	40.0	40.0
3X 40.0	40.0	40.0	40.0	40.0
4X 40.0	40.0	40.0	40.0	40.0
5X 40.0	40.0	40.0	40.0	40.0
6X 39.8	39.7	39.6	39.5	39.3
7X 37.1	36.8	36.4	36.0	35.4
8X 33.2	32.4	31.4	30.4	29.4
9X 30.5	29.6	28.7	27.9	26.8
10X 25.7				

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
X 40.0	40.0	40.0	40.0	40.0
1X 40.0	40.0	40.0	40.0	40.0
2X 40.0	40.0	40.0	40.0	40.0
3X 40.0	40.0	40.0	40.0	40.0
4X 40.0	40.0	40.0	40.0	40.0
5X 40.0	40.0	40.0	40.0	40.0
6X 39.8	39.7	39.6	39.5	39.3
7X 37.1	36.8	36.4	36.0	35.4
8X 33.2	32.4	31.4	30.4	29.4
9X 30.5	29.6	28.7	27.9	26.8
10X 25.7				

Table E23
Speed Profile for MS18E1-W204

Secondary Roads

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
X 40.0	40.0	40.0	40.0	40.0
1X 40.0	40.0	40.0	40.0	40.0
2X 38.3	38.1	37.8	37.5	37.3
3X 35.9	35.7	35.4	35.0	34.7
4X 33.6	33.3	33.0	32.6	32.3
5X 31.3	31.0	30.7	30.3	30.0
6X 29.0	28.7	28.4	28.0	27.7
7X 26.7	26.4	26.1	25.7	25.4
8X 24.4	24.1	23.8	23.4	23.1
10X 21.5				

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
X 39.3	39.3	39.3	39.3	39.3
1X 39.3	39.3	39.3	39.3	39.3
2X 39.0	38.2	37.6	36.9	36.3
3X 35.9	35.5	35.1	34.8	34.5
4X 34.3	34.1	33.9	33.7	33.5
5X 33.4	33.2	33.0	32.8	32.6
6X 32.5	32.0	31.7	31.3	30.9
7X 30.4	29.8	29.2	28.7	28.1
8X 27.5	26.8	26.0	25.3	24.5
9X 23.7	23.0	22.3	21.6	20.6
10X 19.7				

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
X 40.0	40.0	40.0	40.0	40.0
1X 40.0	40.0	40.0	40.0	40.0
2X 40.0	40.0	40.0	40.0	40.0
3X 37.7	37.1	36.6	36.2	35.8
4X 35.5	35.2	35.0	34.7	34.5
5X 34.3	34.2	34.0	33.9	33.7
6X 33.6	33.4	33.2	33.0	32.8
7X 32.7	32.5	32.2	31.8	31.3
8X 30.4	29.7	28.8	27.9	27.2
9X 26.7	25.9	25.4	24.8	24.4
10X 23.7				

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
X 36.3	36.3	36.3	36.3	36.3
1X 36.3	36.3	36.3	36.3	36.3
2X 36.2	35.8	35.1	34.7	34.3
3X 36.2	35.8	35.1	34.7	34.3
4X 34.5	34.3	34.1	33.9	33.7
5X 33.6	33.5	33.3	33.2	32.9
6X 32.7	32.5	32.2	31.8	31.3
7X 30.4	29.7	28.8	27.9	27.2
8X 26.7	25.9	25.4	24.8	24.4
9X 23.7	23.0	22.3	21.6	20.6
10X 19.7				

Trails

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
X 40.0	40.0	40.0	40.0	40.0
1X 40.0	40.0	40.0	40.0	40.0
2X 38.3	38.1	37.8	37.5	37.3
3X 35.9	35.7	35.4	35.0	34.7
4X 33.6	33.3	33.0	32.6	32.3
5X 31.3	31.0	30.7	30.3	30.0
6X 29.0	28.7	28.4	28.0	27.7
7X 26.7	26.4	26.1	25.7	25.4
8X 24.4	24.1	23.8	23.4	23.1
10X 21.5				

Nest Germany - Snow Condition

X=0	2	4	6	8
X 24.8	24.8	24.8	24.8	24.8
1X 24.8	24.8	24.8	24.8	24.8
2X 24.8	24.8	24.8	24.8	24.8
3X 24.8	24.8	24.8	24.8	24.8
4X 24.8	24.8	24.8	24.8	24.8
5X 24.8	24.8	24.8	24.8	24.8
6X 24.8	24.8	24.8	24.8	24.8
7X 24.8	24.8	24.8	24.8	24.8
8X 24.8	24.8	24.8	24.8	24.8
9X 24.8	24.8	24.8	24.8	24.8
10X 24.8	24.8	24.8	24.8	24.8

Nest Germany - Wet Condition

X=0	2	4	6	8
X 24.8	24.8	24.8	24.8	24.8
1X 24.8	24.8	24.8	24.8	24.8
2X 24.8	24.8	24.8	24.8	24.8
3X 24.8	24.8	24.8	24.8	24.8
4X 24.8	24.8	24.8	24.8	24.8
5X 24.8	24.8	24.8	24.8	24.8
6X 24.8	24.8	24.8	24.8	24.8
7X 24.8	24.8	24.8	24.8	24.8
8X 24.8	24.8	24.8	24.8	24.8
9X 24.8	24.8	24.8	24.8	24.8
10X 24.8	24.8	24.8	24.8	24.8

Mid-East - Sand Condition

X=0	2	4	6	8
X 17.8	17.8	17.8	17.8	17.8
1X 17.8	17.8	17.8	17.8	17.8
2X 17.8	17.8	17.8	17.8	17.8
3X 17.8	17.8	17.8	17.8	17.8
4X 17.8	17.8	17.8	17.8	17.8
5X 17.8	17.8	17.8	17.8	17.8
6X 17.8	17.8	17.8	17.8	17.8
7X 17.8	17.8	17.8	17.8	17.8
8X 17.8	17.8	17.8	17.8	17.8
9X 17.8	17.8	17.8	17.8	17.8
10X 17.8	17.8	17.8	17.8	17.8

Off-Road

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
X 24.1	20.5	19.8	18.9	18.8
1X 17.3	16.9	16.8	16.4	16.3
2X 15.7	15.5	15.2	14.9	14.5
3X 14.4	14.2	14.1	13.9	13.9
4X 13.6	13.4	13.3	13.1	13.0
5X 12.8	12.7	12.6	12.5	12.5
6X 12.2	12.0	11.9	11.7	11.6
7X 11.5	11.3	11.2	11.1	11.0
8X 10.7	10.5	10.3	10.1	9.9
9X 9.5	9.0	8.5	8.0	7.5
10X 8.0				

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
X 32.2	27.1	25.3	23.8	22.9
1X 22.3	21.8	21.3	20.9	20.8
2X 19.9	19.4	19.0	18.6	18.3
3X 18.0	17.6	17.3	17.0	16.7
4X 15.9	15.7	15.4	15.2	15.1
5X 15.9	15.7	15.4	15.2	15.1
6X 14.7	14.5	14.3	14.1	13.9
7X 13.7	13.5	13.3	13.1	12.9
8X 12.7	12.5	12.3	12.1	11.9
9X 11.6	11.4	11.2	11.0	10.8
10X 11.0				

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
X 18.9	18.2	17.9	17.8	17.3
1X 16.8	16.4	16.0	15.6	15.2
2X 14.9	14.7	14.4	14.2	14.3
3X 13.8	13.7	13.5	13.4	13.3
4X 13.1	12.9	12.8	12.6	12.5
5X 12.3	12.2	12.1	11.9	11.8
6X 11.7	11.6	11.5	11.3	11.2
7X 10.9	10.7	10.6	10.4	10.2
8X 10.1	9.9	9.7	9.5	9.2
9X 9.0	8.7	8.5	8.3	8.0
10X 8.0				

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
X 17.1	16.3	15.6	15.2	14.9
1X 14.7	14.3	13.9	13.5	13.2
2X 14.0	13.7	13.4	13.2	13.0
3X 12.8	12.5	12.3	12.1	11.9
4X 11.7	11.6	11.4	11.3	11.1
5X 11.0	10.8	10.6	10.5	10.3
6X 10.1	9.9	9.7	9.5	9.2
7X 9.3	9.1	8.9	8.6	8.4
8X 8.4	8.2	8.0	7.8	7.6
9X 7.5	7.3	7.1	6.9	6.6
10X 6.8				

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Table E24
1a for MS48E1-X0198

Table 2.4 Speed Profile for MS4881-304198									
Secondary Roads					Trails				
West Germany - Wet Condition					West Germany - Wet Condition				
PERCENT TOTAL DISTANCE					PERCENT TOTAL DISTANCE				
X=0	2	4	6	8	X=0	2	4	6	8
1	2.0	1.0	1.0	1.0	1	2.0	1.0	1.0	1.0
2	1.0	1.0	1.0	1.0	2	1.0	1.0	1.0	1.0
3	1.0	1.0	1.0	1.0	3	1.0	1.0	1.0	1.0
4	1.0	1.0	1.0	1.0	4	1.0	1.0	1.0	1.0
5	1.0	1.0	1.0	1.0	5	1.0	1.0	1.0	1.0
6	1.0	1.0	1.0	1.0	6	1.0	1.0	1.0	1.0
7	1.0	1.0	1.0	1.0	7	1.0	1.0	1.0	1.0
8	1.0	1.0	1.0	1.0	8	1.0	1.0	1.0	1.0
9	1.0	1.0	1.0	1.0	9	1.0	1.0	1.0	1.0
10	1.0	1.0	1.0	1.0	10	1.0	1.0	1.0	1.0
11	1.0	1.0	1.0	1.0	11	1.0	1.0	1.0	1.0
12	1.0	1.0	1.0	1.0	12	1.0	1.0	1.0	1.0
13	1.0	1.0	1.0	1.0	13	1.0	1.0	1.0	1.0
14	1.0	1.0	1.0	1.0	14	1.0	1.0	1.0	1.0
15	1.0	1.0	1.0	1.0	15	1.0	1.0	1.0	1.0
16	1.0	1.0	1.0	1.0	16	1.0	1.0	1.0	1.0
17	1.0	1.0	1.0	1.0	17	1.0	1.0	1.0	1.0
18	1.0	1.0	1.0	1.0	18	1.0	1.0	1.0	1.0
19	1.0	1.0	1.0	1.0	19	1.0	1.0	1.0	1.0
20	1.0	1.0	1.0	1.0	20	1.0	1.0	1.0	1.0
21	1.0	1.0	1.0	1.0	21	1.0	1.0	1.0	1.0
22	1.0	1.0	1.0	1.0	22	1.0	1.0	1.0	1.0
23	1.0	1.0	1.0	1.0	23	1.0	1.0	1.0	1.0
24	1.0	1.0	1.0	1.0	24	1.0	1.0	1.0	1.0
25	1.0	1.0	1.0	1.0	25	1.0	1.0	1.0	1.0
26	1.0	1.0	1.0	1.0	26	1.0	1.0	1.0	1.0
27	1.0	1.0	1.0	1.0	27	1.0	1.0	1.0	1.0
28	1.0	1.0	1.0	1.0	28	1.0	1.0	1.0	1.0
29	1.0	1.0	1.0	1.0	29	1.0	1.0	1.0	1.0
30	1.0	1.0	1.0	1.0	30	1.0	1.0	1.0	1.0
31	1.0	1.0	1.0	1.0	31	1.0	1.0	1.0	1.0
32	1.0	1.0	1.0	1.0	32	1.0	1.0	1.0	1.0
33	1.0	1.0	1.0	1.0	33	1.0	1.0	1.0	1.0
34	1.0	1.0	1.0	1.0	34	1.0	1.0	1.0	1.0
35	1.0	1.0	1.0	1.0	35	1.0	1.0	1.0	1.0
36	1.0	1.0	1.0	1.0	36	1.0	1.0	1.0	1.0
37	1.0	1.0	1.0	1.0	37	1.0	1.0	1.0	1.0
38	1.0	1.0	1.0	1.0	38	1.0	1.0	1.0	1.0
39	1.0	1.0	1.0	1.0	39	1.0	1.0	1.0	1.0
40	1.0	1.0	1.0	1.0	40	1.0	1.0	1.0	1.0
41	1.0	1.0	1.0	1.0	41	1.0	1.0	1.0	1.0
42	1.0	1.0	1.0	1.0	42	1.0	1.0	1.0	1.0
43	1.0	1.0	1.0	1.0	43	1.0	1.0	1.0	1.0
44	1.0	1.0	1.0	1.0	44	1.0	1.0	1.0	1.0
45	1.0	1.0	1.0	1.0	45	1.0	1.0	1.0	1.0
46	1.0	1.0	1.0	1.0	46	1.0	1.0	1.0	1.0
47	1.0	1.0	1.0	1.0	47	1.0	1.0	1.0	1.0
48	1.0	1.0	1.0	1.0	48	1.0	1.0	1.0	1.0
49	1.0	1.0	1.0	1.0	49	1.0	1.0	1.0	1.0
50	1.0	1.0	1.0	1.0	50	1.0	1.0	1.0	1.0
51	1.0	1.0	1.0	1.0	51	1.0	1.0	1.0	1.0
52	1.0	1.0	1.0	1.0	52	1.0	1.0	1.0	1.0
53	1.0	1.0	1.0	1.0	53	1.0	1.0	1.0	1.0
54	1.0	1.0	1.0	1.0	54	1.0	1.0	1.0	1.0
55	1.0	1.0	1.0	1.0	55	1.0	1.0	1.0	1.0
56	1.0	1.0	1.0	1.0	56	1.0	1.0	1.0	1.0
57	1.0	1.0	1.0	1.0	57	1.0	1.0	1.0	1.0
58	1.0	1.0	1.0	1.0	58	1.0	1.0	1.0	1.0
59	1.0	1.0	1.0	1.0	59	1.0	1.0	1.0	1.0
60	1.0	1.0	1.0	1.0	60	1.0	1.0	1.0	1.0
61	1.0	1.0	1.0	1.0	61	1.0	1.0	1.0	1.0
62	1.0	1.0	1.0	1.0	62	1.0	1.0	1.0	1.0
63	1.0	1.0	1.0	1.0	63	1.0	1.0	1.0	1.0
64	1.0	1.0	1.0	1.0	64	1.0	1.0	1.0	1.0
65	1.0	1.0	1.0	1.0	65	1.0	1.0	1.0	1.0
66	1.0	1.0	1.0	1.0	66	1.0	1.0	1.0	1.0
67	1.0	1.0	1.0	1.0	67	1.0	1.0	1.0	1.0
68	1.0	1.0	1.0	1.0	68	1.0	1.0	1.0	1.0
69	1.0	1.0	1.0	1.0	69	1.0	1.0	1.0	1.0
70	1.0	1.0	1.0	1.0	70	1.0	1.0	1.0	1.0
71	1.0	1.0	1.0	1.0	71	1.0	1.0	1.0	1.0
72	1.0	1.0	1.0	1.0	72	1.0	1.0	1.0	1.0
73	1.0	1.0	1.0	1.0	73	1.0	1.0	1.0	1.0
74	1.0	1.0	1.0	1.0	74	1.0	1.0	1.0	1.0
75	1.0	1.0	1.0	1.0	75	1.0	1.0	1.0	1.0
76	1.0	1.0	1.0	1.0	76	1.0	1.0	1.0	1.0
77	1.0	1.0	1.0	1.0	77	1.0	1.0	1.0	1.0
78	1.0	1.0	1.0	1.0	78	1.0	1.0	1.0	1.0
79	1.0	1.0	1.0	1.0	79	1.0	1.0	1.0	1.0
80	1.0	1.0	1.0	1.0	80	1.0	1.0	1.0	1.0
81	1.0	1.0	1.0	1.0	81	1.0	1.0	1.0	1.0
82	1.0	1.0	1.0	1.0	82	1.0	1.0	1.0	1.0
83	1.0	1.0	1.0	1.0	83	1.0	1.0	1.0	1.0
84	1.0	1.0	1.0	1.0	84	1.0	1.0	1.0	1.0
85	1.0	1.0	1.0	1.0	85	1.0	1.0	1.0	1.0
86	1.0	1.0	1.0	1.0	86	1.0	1.0	1.0	1.0
87	1.0	1.0	1.0	1.0	87	1.0	1.0	1.0	1.0
88	1.0	1.0	1.0	1.0	88	1.0	1.0	1.0	1.0
89	1.0	1.0	1.0	1.0	89	1.0	1.0	1.0	1.0
90	1.0	1.0	1.0	1.0	90	1.0	1.0	1.0	1.0
91	1.0	1.0	1.0	1.0	91	1.0	1.0	1.0	1.0
92	1.0	1.0	1.0	1.0	92	1.0	1.0	1.0	1.0
93	1.0	1.0	1.0	1.0	93	1.0	1.0	1.0	1.0
94	1.0	1.0	1.0	1.0	94	1.0	1.0	1.0	1.0
95	1.0	1.0	1.0	1.0	95	1.0	1.0	1.0	1.0
96	1.0	1.0	1.0	1.0	96	1.0	1.0	1.0	1.0
97	1.0	1.0	1.0	1.0	97	1.0	1.0	1.0	1.0
98	1.0	1.0	1.0	1.0	98	1.0	1.0	1.0	1.0
99	1.0	1.0	1.0	1.0	99	1.0	1.0	1.0	1.0
100	1.0	1.0	1.0	1.0	100	1.0	1.0	1.0	1.0

Speed Profile for M548E1-FH70

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Table E27
Speed Profile for UET-FH70

Primary Roads										Secondary Roads										Speed Profile for US-170										Trails										Off-Road									
West Germany - Wet Condition										West Germany - Snow Condition										West Germany - Wet Condition										West Germany - Snow Condition										West Germany - Wet Condition									
PERCENT TOTAL DISTANCE										PERCENT TOTAL DISTANCE										PERCENT TOTAL DISTANCE										PERCENT TOTAL DISTANCE										PERCENT TOTAL DISTANCE									
X=0	2	4	6	8	10	12	14	16	18	X=0	2	4	6	8	10	12	14	16	18	X=0	2	4	6	8	10	12	14	16	18	X=0	2	4	6	8	10	12	14	16	18	X=0	2	4	6	8	10	12	14	16	18
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4																										

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Table 230
File for A

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Profile for

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Table E32

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Table E33
Profile for M110E2

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Table E3S
Speed Profile for M60A2

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Table E36
Speed Profile for MSABE1

Primary Roads		Secondary Roads		West Germany - Wet Condition		West Germany - Snow Condition		Mid-East - Wet Condition		Mid-East - Sand Condition		Off-Road	
PERCENT TOTAL DISTANCE		PERCENT TOTAL DISTANCE		PERCENT TOTAL DISTANCE		PERCENT TOTAL DISTANCE		PERCENT TOTAL DISTANCE		PERCENT TOTAL DISTANCE		PERCENT TOTAL DISTANCE	
X=0	X=100	X=0	X=100	X=0	X=100	X=0	X=100	X=0	X=100	X=0	X=100	X=0	X=100
1	40.0	1	40.0	1	40.0	1	40.0	1	40.0	1	40.0	1	40.0
2	40.0	2	40.0	2	40.0	2	40.0	2	40.0	2	40.0	2	40.0
3	40.0	3	40.0	3	40.0	3	40.0	3	40.0	3	40.0	3	40.0
4	40.0	4	40.0	4	40.0	4	40.0	4	40.0	4	40.0	4	40.0
5	40.0	5	40.0	5	40.0	5	40.0	5	40.0	5	40.0	5	40.0
6	40.0	6	40.0	6	40.0	6	40.0	6	40.0	6	40.0	6	40.0
7	40.0	7	40.0	7	40.0	7	40.0	7	40.0	7	40.0	7	40.0
8	40.0	8	40.0	8	40.0	8	40.0	8	40.0	8	40.0	8	40.0
9	40.0	9	40.0	9	40.0	9	40.0	9	40.0	9	40.0	9	40.0
10	40.0	10	40.0	10	40.0	10	40.0	10	40.0	10	40.0	10	40.0
11	40.0	11	40.0	11	40.0	11	40.0	11	40.0	11	40.0	11	40.0
12	40.0	12	40.0	12	40.0	12	40.0	12	40.0	12	40.0	12	40.0
13	40.0	13	40.0	13	40.0	13	40.0	13	40.0	13	40.0	13	40.0
14	40.0	14	40.0	14	40.0	14	40.0	14	40.0	14	40.0	14	40.0
15	40.0	15	40.0	15	40.0	15	40.0	15	40.0	15	40.0	15	40.0
16	40.0	16	40.0	16	40.0	16	40.0	16	40.0	16	40.0	16	40.0
17	40.0	17	40.0	17	40.0	17	40.0	17	40.0	17	40.0	17	40.0
18	40.0	18	40.0	18	40.0	18	40.0	18	40.0	18	40.0	18	40.0
19	40.0	19	40.0	19	40.0	19	40.0	19	40.0	19	40.0	19	40.0
20	40.0	20	40.0	20	40.0	20	40.0	20	40.0	20	40.0	20	40.0
21	40.0	21	40.0	21	40.0	21	40.0	21	40.0	21	40.0	21	40.0
22	40.0	22	40.0	22	40.0	22	40.0	22	40.0	22	40.0	22	40.0
23	40.0	23	40.0	23	40.0	23	40.0	23	40.0	23	40.0	23	40.0
24	40.0	24	40.0	24	40.0	24	40.0	24	40.0	24	40.0	24	40.0
25	40.0	25	40.0	25	40.0	25	40.0	25	40.0	25	40.0	25	40.0
26	40.0	26	40.0	26	40.0	26	40.0	26	40.0	26	40.0	26	40.0
27	40.0	27	40.0	27	40.0	27	40.0	27	40.0	27	40.0	27	40.0
28	40.0	28	40.0	28	40.0	28	40.0	28	40.0	28	40.0	28	40.0
29	40.0	29	40.0	29	40.0	29	40.0	29	40.0	29	40.0	29	40.0
30	40.0	30	40.0	30	40.0	30	40.0	30	40.0	30	40.0	30	40.0
31	40.0	31	40.0	31	40.0	31	40.0	31	40.0	31	40.0	31	40.0
32	40.0	32	40.0	32	40.0	32	40.0	32	40.0	32	40.0	32	40.0
33	40.0	33	40.0	33	40.0	33	40.0	33	40.0	33	40.0	33	40.0
34	40.0	34	40.0	34	40.0	34	40.0	34	40.0	34	40.0	34	40.0
35	40.0	35	40.0	35	40.0	35	40.0	35	40.0	35	40.0	35	40.0
36	40.0	36	40.0	36	40.0	36	40.0	36	40.0	36	40.0	36	40.0
37	40.0	37	40.0	37	40.0	37	40.0	37	40.0	37	40.0	37	40.0
38	40.0	38	40.0	38	40.0	38	40.0	38	40.0	38	40.0	38	40.0
39	40.0	39	40.0	39	40.0	39	40.0	39	40.0	39	40.0	39	40.0
40	40.0	40	40.0	40	40.0	40	40.0	40	40.0	40	40.0	40	40.0

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Table E37
Speed Profile for MS77AL

Primary Roads

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
1X	42.0	42.0	42.0	42.0
2X	42.0	42.0	42.0	42.0
3X	42.0	42.0	42.0	42.0
4X	42.0	42.0	42.0	42.0
5X	41.9	41.6	41.2	40.8
6X	41.9	41.6	41.2	40.8
7X	38.6	38.2	37.7	37.2
8X	35.7	34.9	34.0	33.2
9X	31.2	30.3	29.5	28.6
10X	26.4			

Secondary Roads

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
1X	42.0	42.0	42.0	42.0
2X	42.0	42.0	42.0	42.0
3X	41.8	41.6	41.5	41.0
4X	40.9	39.5	37.7	36.3
5X	38.0	37.7	37.1	36.0
6X	36.0	36.3	35.7	35.2
7X	34.7	34.1	33.0	32.6
8X	32.0	31.3	30.0	29.1
9X	28.3	27.5	26.8	26.0
10X	24.0			

Trails

West Germany - Wet Condition

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
1X	30.2	30.7	34.2	33.1
2X	31.3	30.5	28.8	28.6
3X	28.1	27.6	27.2	26.9
4X	26.2	25.8	25.3	24.6
5X	23.1	22.5	22.0	21.2
6X	20.9	20.6	20.3	20.0
7X	19.6	19.4	19.2	18.8
8X	18.6	18.2	17.9	17.3
9X	17.0	16.8	16.5	16.1
10X	15.9	15.7	15.5	15.0

West Germany - Snow Condition

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
1X	41.2	41.2	41.0	38.7
2X	36.4	35.6	35.3	34.7
3X	33.0	32.3	31.4	30.7
4X	29.0	28.5	27.7	26.8
5X	25.6	24.9	24.2	23.6
6X	22.1	21.7	21.4	21.1
7X	20.6	20.5	20.1	19.2
8X	19.3	19.0	18.5	18.2
9X	17.8	17.5	17.3	16.8
10X	16.6	16.4	16.1	15.6

Mid-East - Wet Condition

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
1X	42.0	42.0	42.0	42.0
2X	42.0	42.0	42.0	42.0
3X	42.0	42.0	42.0	42.0
4X	42.0	42.0	42.0	42.0
5X	42.0	42.0	42.0	42.0
6X	41.0	40.7	40.3	39.6
7X	39.1	38.6	38.0	37.3
8X	35.5	34.0	32.7	31.5
9X	29.6	28.8	28.0	27.3
10X	25.9			

Mid-East - Sand Condition

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
1X	38.3	38.3	38.3	38.3
2X	38.3	38.3	38.3	38.3
3X	38.3	38.3	38.3	38.3
4X	38.3	38.3	38.3	38.3
5X	38.1	36.7	36.5	36.2
6X	37.3	36.7	36.1	35.6
7X	36.0	34.8	34.6	34.0
8X	35.8	34.3	32.8	32.0
9X	34.9	34.0	32.7	31.5
10X	24.1	23.4	22.7	22.1

Off-Road

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
1X	28.8	25.7	23.5	22.3
2X	20.8	20.2	19.6	19.1
3X	18.2	17.9	17.6	17.4
4X	16.9	16.7	16.5	16.2
5X	15.8	15.6	15.4	15.3
6X	15.0	14.8	14.7	14.5
7X	14.3	14.1	13.9	13.7
8X	13.5	13.4	13.2	13.0
9X	12.7	12.6	12.4	12.1
10X	11.4	11.2	11.0	10.7

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
1X	40.8	32.3	30.5	29.4
2X	27.6	27.0	26.3	25.5
3X	24.2	23.6	23.0	22.5
4X	21.6	21.2	20.8	20.5
5X	19.8	19.5	19.2	18.8
6X	18.5	18.3	18.1	17.9
7X	17.5	17.3	17.1	16.9
8X	16.6	16.4	16.2	15.9
9X	15.5	15.3	15.1	14.8
10X	14.4	13.8	6.9	2.9

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
1X	31.9	28.8	26.6	24.4
2X	21.9	21.2	20.5	19.6
3X	18.4	18.0	17.7	17.4
4X	16.7	16.4	16.2	15.9
5X	15.5	15.3	15.2	15.0
6X	14.7	14.5	14.4	14.2
7X	13.9	13.7	13.6	13.4
8X	13.0	12.8	12.6	12.4
9X	11.9	11.6	11.3	6.3
10X	1.7	1.2	1.0	0.8

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
1X	20.6	20.5	20.4	20.3
2X	20.6	20.5	20.4	20.3
3X	17.2	16.9	16.7	16.4
4X	16.0	15.8	15.6	15.4
5X	15.1	14.9	14.7	14.5
6X	14.1	14.0	13.8	13.5
7X	13.9	13.6	13.4	13.2
8X	13.1	12.7	12.4	12.1
9X	11.1	10.7	10.4	10.1
10X	7.5	7.2	6.8	6.3

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Table E38
Speed Profile for MW723

Primary Roads			Secondary Roads			Met Germany - Met Condition			Trails			Off-Road		
PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE		
X=0	2	4	X=0	2	4	X=0	2	4	X=0	2	4	X=0	2	4
1	43.7	43.7	43.7	43.7	43.7	1	43.7	43.7	43.7	43.7	43.7	1	32.1	32.1
1X	43.7	43.7	43.7	43.7	43.7	1X	43.7	43.7	43.7	43.7	43.7	1X	22.3	22.3
2X	43.7	43.7	43.7	43.7	43.7	2X	43.7	43.7	43.7	43.7	43.7	2X	21.8	21.8
3X	43.7	43.7	43.7	43.7	43.7	3X	43.7	43.7	43.7	43.7	43.7	3X	18.7	18.7
4X	43.7	43.7	43.7	43.7	43.7	4X	43.7	43.7	43.7	43.7	43.7	4X	16.4	16.4
5X	43.7	43.7	43.7	43.7	43.7	5X	43.7	43.7	43.7	43.7	43.7	5X	15.2	15.2
6X	43.7	43.7	43.7	43.7	43.7	6X	43.7	43.7	43.7	43.7	43.7	6X	14.4	14.4
7X	43.7	43.7	43.7	43.7	43.7	7X	43.7	43.7	43.7	43.7	43.7	7X	13.6	13.6
8X	43.7	43.7	43.7	43.7	43.7	8X	43.7	43.7	43.7	43.7	43.7	8X	12.9	12.9
9X	43.7	43.7	43.7	43.7	43.7	9X	43.7	43.7	43.7	43.7	43.7	9X	11.9	11.9
10X	27.2					10X	24.6					10X	1.6	
Met Germany - Snow Condition														
PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE		
X=0	2	4	X=0	2	4	X=0	2	4	X=0	2	4	X=0	2	4
1	43.7	43.7	43.7	43.7	43.7	1	43.7	43.7	43.7	43.7	43.7	1	35.3	35.3
1X	43.7	43.7	43.7	43.7	43.7	1X	43.7	43.7	43.7	43.7	43.7	1X	31.0	31.0
2X	43.7	43.7	43.7	43.7	43.7	2X	43.7	43.7	43.7	43.7	43.7	2X	28.1	28.1
3X	43.7	43.7	43.7	43.7	43.7	3X	43.7	43.7	43.7	43.7	43.7	3X	25.3	25.3
4X	43.7	43.7	43.7	43.7	43.7	4X	43.7	43.7	43.7	43.7	43.7	4X	22.6	22.6
5X	43.7	43.7	43.7	43.7	43.7	5X	43.7	43.7	43.7	43.7	43.7	5X	20.9	20.9
6X	43.7	43.7	43.7	43.7	43.7	6X	43.7	43.7	43.7	43.7	43.7	6X	19.3	19.3
7X	43.7	43.7	43.7	43.7	43.7	7X	43.7	43.7	43.7	43.7	43.7	7X	18.0	18.0
8X	43.7	43.7	43.7	43.7	43.7	8X	43.7	43.7	43.7	43.7	43.7	8X	16.9	16.9
9X	43.7	43.7	43.7	43.7	43.7	9X	43.7	43.7	43.7	43.7	43.7	9X	15.7	15.7
10X	26.9					10X	21.2					10X	3.2	
Mid-East - Met Condition														
PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE		
X=0	2	4	X=0	2	4	X=0	2	4	X=0	2	4	X=0	2	4
1	43.7	43.7	43.7	43.7	43.7	1	43.7	43.7	43.7	43.7	43.7	1	35.2	35.2
1X	43.7	43.7	43.7	43.7	43.7	1X	43.7	43.7	43.7	43.7	43.7	1X	24.7	24.7
2X	43.7	43.7	43.7	43.7	43.7	2X	43.7	43.7	43.7	43.7	43.7	2X	21.4	21.4
3X	43.7	43.7	43.7	43.7	43.7	3X	43.7	43.7	43.7	43.7	43.7	3X	19.1	19.1
4X	43.7	43.7	43.7	43.7	43.7	4X	43.7	43.7	43.7	43.7	43.7	4X	17.1	17.1
5X	43.7	43.7	43.7	43.7	43.7	5X	43.7	43.7	43.7	43.7	43.7	5X	15.8	15.8
6X	43.7	43.7	43.7	43.7	43.7	6X	43.7	43.7	43.7	43.7	43.7	6X	14.7	14.7
7X	43.7	43.7	43.7	43.7	43.7	7X	43.7	43.7	43.7	43.7	43.7	7X	13.5	13.5
8X	43.7	43.7	43.7	43.7	43.7	8X	43.7	43.7	43.7	43.7	43.7	8X	12.7	12.7
9X	43.7	43.7	43.7	43.7	43.7	9X	43.7	43.7	43.7	43.7	43.7	9X	11.9	11.9
10X	38.5					10X	26.3					10X	1.1	
Mid-East - Sand Condition														
PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE		
X=0	2	4	X=0	2	4	X=0	2	4	X=0	2	4	X=0	2	4
1	43.7	43.7	43.7	43.7	43.7	1	43.7	43.7	43.7	43.7	43.7	1	22.6	22.6
1X	43.7	43.7	43.7	43.7	43.7	1X	43.7	43.7	43.7	43.7	43.7	1X	21.6	21.6
2X	43.7	43.7	43.7	43.7	43.7	2X	43.7	43.7	43.7	43.7	43.7	2X	20.1	20.1
3X	43.7	43.7	43.7	43.7	43.7	3X	43.7	43.7	43.7	43.7	43.7	3X	18.5	18.5
4X	43.7	43.7	43.7	43.7	43.7	4X	43.7	43.7	43.7	43.7	43.7	4X	17.3	17.3
5X	43.7	43.7	43.7	43.7	43.7	5X	43.7	43.7	43.7	43.7	43.7	5X	16.8	16.8
6X	43.7	43.7	43.7	43.7	43.7	6X	43.7	43.7	43.7	43.7	43.7	6X	15.9	15.9
7X	43.7	43.7	43.7	43.7	43.7	7X	43.7	43.7	43.7	43.7	43.7	7X	14.9	14.9
8X	43.7	43.7	43.7	43.7	43.7	8X	43.7	43.7	43.7	43.7	43.7	8X	13.6	13.6
9X	43.7	43.7	43.7	43.7	43.7	9X	43.7	43.7	43.7	43.7	43.7	9X	12.7	12.7
10X	29.6					10X	21.4					10X	4.7	

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Primary Roads

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Table E41
Speed Profile for MS61

Primary Roads

Secondary Roads

Trails

Off-Road

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
1X 55.0	55.0	55.0	55.0	55.0
1X 55.0	55.0	55.0	55.0	55.0
2X 55.0	55.0	55.0	55.0	55.0
3X 55.0	55.0	55.0	55.0	55.0
4X 55.0	55.0	55.0	55.0	55.0
5X 55.0	55.0	55.0	55.0	55.0
6X 55.0	55.0	55.0	55.0	55.0
7X 55.0	55.0	55.0	55.0	55.0
8X 55.0	55.0	55.0	55.0	55.0
9X 55.0	55.0	55.0	55.0	55.0
10X 55.0	55.0	55.0	55.0	55.0

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
1X 35.5	34.8	34.3	33.8	33.6
1X 33.4	33.1	32.9	32.8	32.7
2X 32.6	32.5	32.4	32.3	32.3
3X 32.2	32.2	32.1	32.1	32.1
4X 32.0	32.0	32.0	32.0	32.0
5X 31.9	31.8	31.6	31.5	31.3
6X 31.1	31.0	30.9	30.8	30.6
7X 30.5	30.4	30.2	30.0	29.6
8X 29.1	28.6	28.1	27.6	26.9
9X 26.3	25.7	25.1	24.5	23.7
10X 22.9				

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
1X 55.0	55.0	55.0	55.0	55.0
1X 55.0	55.0	55.0	55.0	55.0
2X 55.0	55.0	55.0	55.0	55.0
3X 55.0	55.0	55.0	55.0	55.0
4X 55.0	55.0	55.0	55.0	55.0
5X 55.0	55.0	55.0	55.0	55.0
6X 55.0	55.0	55.0	55.0	55.0
7X 55.0	55.0	55.0	55.0	55.0
8X 55.0	55.0	55.0	55.0	55.0
9X 55.0	55.0	55.0	55.0	55.0
10X 55.0	55.0	55.0	55.0	55.0

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
1X 55.0	55.0	55.0	55.0	55.0
1X 55.0	55.0	55.0	55.0	55.0
2X 55.0	55.0	55.0	55.0	55.0
3X 55.0	55.0	55.0	55.0	55.0
4X 55.0	55.0	55.0	55.0	55.0
5X 55.0	55.0	55.0	55.0	55.0
6X 55.0	55.0	55.0	55.0	55.0
7X 55.0	55.0	55.0	55.0	55.0
8X 55.0	55.0	55.0	55.0	55.0
9X 55.0	55.0	55.0	55.0	55.0
10X 55.0	55.0	55.0	55.0	55.0

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
1X 50.7	50.7	50.7	50.7	50.7
1X 50.7	50.6	50.4	49.2	48.3
2X 47.5	46.8	46.2	45.4	44.8
3X 43.7	42.8	42.0	41.3	40.7
4X 40.2	39.7	39.3	38.9	38.5
5X 38.2	37.9	37.7	37.4	37.1
6X 36.9	36.6	36.3	36.0	35.6
7X 35.2	34.8	34.3	33.8	33.2
8X 32.6	32.0	31.2	30.5	29.6
9X 28.8	28.0	27.3	26.4	25.3
10X 24.4				

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
1X 33.6	33.6	33.3	33.0	32.7
1X 32.5	32.4	32.3	32.2	32.2
2X 32.1	32.1	32.0	32.0	32.0
3X 31.9	31.8	31.7	31.4	31.1
4X 30.8	30.6	30.4	30.2	29.9
5X 29.7	29.5	29.3	29.2	29.0
6X 28.9	28.7	28.6	28.4	28.2
7X 27.9	27.6	27.2	26.8	26.3
8X 25.8	25.3	24.6	24.0	23.4
9X 22.7	22.0	21.4	20.8	19.9
10X 19.1				

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
1X 50.7	50.7	50.7	50.7	50.7
1X 50.7	50.7	50.7	50.7	50.7
2X 50.7	50.7	50.7	50.7	50.7
3X 50.7	50.7	50.7	50.7	50.7
4X 50.7	50.7	50.7	50.7	50.7
5X 50.7	50.7	50.7	50.7	50.7
6X 50.7	50.7	50.7	50.7	50.7
7X 50.7	50.7	50.7	50.7	50.7
8X 50.7	50.7	50.7	50.7	50.7
9X 50.7	50.7	50.7	50.7	50.7
10X 50.7	50.7	50.7	50.7	50.7

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
1X 30.3	30.3	30.3	30.3	30.3
1X 30.3	30.3	30.3	30.3	30.3
2X 30.3	30.3	30.3	30.3	30.3
3X 30.3	30.3	30.3	30.3	30.3
4X 30.3	30.3	30.3	30.3	30.3
5X 30.3	30.3	30.3	30.3	30.3
6X 30.3	30.3	30.3	30.3	30.3
7X 30.3	30.3	30.3	30.3	30.3
8X 30.3	30.3	30.3	30.3	30.3
9X 30.3	30.3	30.3	30.3	30.3
10X 30.3	30.3	30.3	30.3	30.3

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
1X 10.5	23.6	21.7	20.8	20.2
1X 19.6	19.6	18.7	18.3	17.9
2X 17.9	17.3	17.0	16.9	16.7
3X 16.9	16.2	16.1	16.0	15.7
4X 15.5	15.4	15.3	15.2	15.0
5X 14.9	14.7	14.6	14.5	14.4
6X 14.2	14.1	14.0	13.9	13.7
7X 13.5	13.3	13.1	13.0	12.9
8X 12.8	12.6	12.5	12.3	12.1
9X 11.8	11.6	11.4	11.2	11.0
10X 11.0				

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
1X 26.7	22.7	21.7	21.0	20.4
1X 19.9	19.6	19.3	19.0	18.7
2X 18.5	18.2	18.0	17.7	17.5
3X 17.3	17.1	17.0	16.8	16.6
4X 16.4	16.2	16.0	15.9	15.7
5X 15.6	15.4	15.3	15.2	15.0
6X 14.9	14.8	14.6	14.5	14.3
7X 14.2	14.0	13.8	13.7	13.5
8X 13.3	13.2	13.0	12.8	12.6
9X 12.4	12.2	12.0	11.8	11.6
10X 12.4	12.2	12.0	11.8	11.6

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
1X 18.2	18.2	18.0	17.7	17.5
1X 17.6	17.2	16.8	16.5	16.2
2X 16.0	15.7	15.5	15.3	15.2
3X 15.0	14.8	14.7	14.6	14.5
4X 14.3	14.2	14.1	14.0	13.9
5X 13.8	13.7	13.6	13.5	13.3
6X 13.2	13.1	12.9	12.7	12.5
7X 12.4	12.2	12.0	11.8	11.6
8X 11.4	11.2	11.0	10.8	10.6
9X 11.3	11.0	10.8	10.6	10.4
10X 11.3	11.0	10.8	10.6	10.4

PERCENT TOTAL DISTANCE

X=0	2	4	6	8
1X 19.0	17.7	17.6	17.5	17.4
1X 19.0	17.7	17.6	17.5	17.4
2X 16.8	16.6	16.5	16.3	16.1
3X 15.9	15.7	15.6	15.4	15.3
4X 14.9	14.7	14.6	14.4	14.3
5X 13.7	13.5	13.4	13.2	13.1
6X 12.9	12.8	12.7	12.5	12.4
7X 12.1	12.0	11.9	11.7	11.6
8X 11.3	11.2	11.0	10.8	10.6
9X 11.3	11.0	10.8	10.6	10.4
10X 11.3	11.0	10.8	10.6	10.4

Table E42
Speed Profile for M813

Primary Roads		Secondary Roads		West Germany - Wet Condition		Trails		Off-Road	
PERCENT TOTAL DISTANCE		PERCENT TOTAL DISTANCE		PERCENT TOTAL DISTANCE		PERCENT TOTAL DISTANCE		PERCENT TOTAL DISTANCE	
X=0	X=2	X=4	X=6	X=0	X=2	X=4	X=6	X=0	X=2
1	50.0	50.0	50.0	1	50.0	49.2	48.3	1	50.0
11	50.0	50.0	50.0	11	47.6	47.1	46.6	11	47.6
21	50.0	50.0	50.0	21	45.8	45.4	44.9	21	45.8
31	50.0	50.0	50.0	31	43.3	42.8	42.3	31	43.3
41	50.0	50.0	50.0	41	41.1	40.7	40.3	41	41.1
51	49.9	49.6	48.9	51	39.2	38.9	38.5	51	39.2
61	47.7	47.3	46.9	61	37.4	37.0	36.6	61	37.4
71	45.8	45.4	45.0	71	35.8	35.4	35.0	71	35.8
81	44.0	43.6	43.2	81	34.6	34.2	33.8	81	34.6
91	42.3	41.9	41.5	91	33.1	32.7	32.3	91	33.1
101	40.7	40.3	39.9	101	31.8	31.4	31.0	101	31.8
111	39.2	38.8	38.4	111	30.4	30.0	29.6	111	30.4
121	37.7	37.3	36.9	121	29.1	28.7	28.3	121	29.1
131	36.3	35.9	35.5	131	27.9	27.5	27.1	131	27.9
141	35.0	34.6	34.2	141	26.7	26.3	25.9	141	26.7
151	33.8	33.4	33.0	151	25.6	25.2	24.8	151	25.6
161	32.6	32.2	31.8	161	24.6	24.2	23.8	161	24.6
171	31.5	31.1	30.7	171	23.7	23.3	22.9	171	23.7
181	30.4	30.0	29.6	181	22.9	22.5	22.1	181	22.9
191	29.4	29.0	28.6	191	22.1	21.7	21.3	191	22.1
201	28.4	28.0	27.6	201	21.4	21.0	20.6	201	21.4
211	27.5	27.1	26.7	211	20.7	20.3	19.9	211	20.7
221	26.7	26.3	25.9	221	20.1	19.7	19.3	221	20.1
231	26.0	25.6	25.2	231	19.5	19.1	18.7	231	19.5
241	25.4	25.0	24.6	241	19.0	18.6	18.2	241	19.0
251	24.8	24.4	24.0	251	18.5	18.1	17.7	251	18.5
261	24.3	23.9	23.5	261	18.0	17.6	17.2	261	18.0
271	23.8	23.4	23.0	271	17.6	17.2	16.8	271	17.6
281	23.3	22.9	22.5	281	17.1	16.7	16.3	281	17.1
291	22.9	22.5	22.1	291	16.7	16.3	15.9	291	16.7
301	22.4	22.0	21.6	301	16.3	15.9	15.5	301	16.3
311	22.0	21.6	21.2	311	15.9	15.5	15.1	311	15.9
321	21.6	21.2	20.8	321	15.5	15.1	14.7	321	15.5
331	21.2	20.8	20.4	331	15.1	14.7	14.3	331	15.1
341	20.8	20.4	20.0	341	14.7	14.3	13.9	341	14.7
351	20.4	20.0	19.6	351	14.3	13.9	13.5	351	14.3
361	20.0	19.6	19.2	361	13.9	13.5	13.1	361	13.9
371	19.6	19.2	18.8	371	13.5	13.1	12.7	371	13.5
381	19.2	18.8	18.4	381	13.1	12.7	12.3	381	13.1
391	18.8	18.4	18.0	391	12.7	12.3	11.9	391	12.7
401	18.4	18.0	17.6	401	12.3	11.9	11.5	401	12.3
411	18.0	17.6	17.2	411	11.9	11.5	11.1	411	11.9
421	17.6	17.2	16.8	421	11.5	11.1	10.7	421	11.5
431	17.2	16.8	16.4	431	11.1	10.7	10.3	431	11.1
441	16.8	16.4	16.0	441	10.7	10.3	9.9	441	10.7
451	16.4	16.0	15.6	451	10.3	9.9	9.5	451	10.3
461	16.0	15.6	15.2	461	9.9	9.5	9.1	461	9.9
471	15.6	15.2	14.8	471	9.5	9.1	8.7	471	9.5
481	15.2	14.8	14.4	481	9.1	8.7	8.3	481	9.1
491	14.8	14.4	14.0	491	8.7	8.3	7.9	491	8.7
501	14.4	14.0	13.6	501	8.3	7.9	7.5	501	8.3
511	14.0	13.6	13.2	511	7.9	7.5	7.1	511	7.9
521	13.6	13.2	12.8	521	7.5	7.1	6.7	521	7.5
531	13.2	12.8	12.4	531	7.1	6.7	6.3	531	7.1
541	12.8	12.4	12.0	541	6.7	6.3	5.9	541	6.7
551	12.4	12.0	11.6	551	6.3	5.9	5.5	551	6.3
561	12.0	11.6	11.2	561	5.9	5.5	5.1	561	5.9
571	11.6	11.2	10.8	571	5.5	5.1	4.7	571	5.5
581	11.2	10.8	10.4	581	5.1	4.7	4.3	581	5.1
591	10.8	10.4	10.0	591	4.7	4.3	3.9	591	4.7
601	10.4	10.0	9.6	601	4.3	3.9	3.5	601	4.3
611	10.0	9.6	9.2	611	3.9	3.5	3.1	611	3.9
621	9.6	9.2	8.8	621	3.5	3.1	2.7	621	3.5
631	9.2	8.8	8.4	631	3.1	2.7	2.3	631	3.1
641	8.8	8.4	8.0	641	2.7	2.3	1.9	641	2.7
651	8.4	8.0	7.6	651	2.3	1.9	1.5	651	2.3
661	8.0	7.6	7.2	661	1.9	1.5	1.1	661	1.9
671	7.6	7.2	6.8	671	1.5	1.1	0.7	671	1.5
681	7.2	6.8	6.4	681	1.1	0.7	0.3	681	1.1
691	6.8	6.4	6.0	691	0.7	0.3	0.0	691	0.7
701	6.4	6.0	5.6	701	0.3	0.0	0.0	701	0.3
711	6.0	5.6	5.2	711	0.0	0.0	0.0	711	0.0
721	5.6	5.2	4.8	721	0.0	0.0	0.0	721	0.0
731	5.2	4.8	4.4	731	0.0	0.0	0.0	731	0.0
741	4.8	4.4	4.0	741	0.0	0.0	0.0	741	0.0
751	4.4	4.0	3.6	751	0.0	0.0	0.0	751	0.0
761	4.0	3.6	3.2	761	0.0	0.0	0.0	761	0.0
771	3.6	3.2	2.8	771	0.0	0.0	0.0	771	0.0
781	3.2	2.8	2.4	781	0.0	0.0	0.0	781	0.0
791	2.8	2.4	2.0	791	0.0	0.0	0.0	791	0.0
801	2.4	2.0	1.6	801	0.0	0.0	0.0	801	0.0
811	2.0	1.6	1.2	811	0.0	0.0	0.0	811	0.0
821	1.6	1.2	0.8	821	0.0	0.0	0.0	821	0.0
831	1.2	0.8	0.4	831	0.0	0.0	0.0	831	0.0
841	0.8	0.4	0.0	841	0.0	0.0	0.0	841	0.0
851	0.4	0.0	0.0	851	0.0	0.0	0.0	851	0.0
861	0.0	0.0	0.0	861	0.0	0.0	0.0	861	0.0
871	0.0	0.0	0.0	871	0.0	0.0	0.0	871	0.0
881	0.0	0.0	0.0	881	0.0	0.0	0.0	881	0.0
891	0.0	0.0	0.0	891	0.0	0.0	0.0	891	0.0
901	0.0	0.0	0.0	901	0.0	0.0	0.0	901	0.0
911	0.0	0.0	0.0	911	0.0	0.0	0.0	911	0.0
921	0.0	0.0	0.0	921	0.0	0.0	0.0	921	0.0
931	0.0	0.0	0.0	931	0.0	0.0	0.0	931	0.0
941	0.0	0.0	0.0	941	0.0	0.0	0.0	941	0.0
951	0.0	0.0	0.0	951	0.0	0.0	0.0	951	0.0
961	0.0	0.0	0.0	961	0.0	0.0	0.0	961	0.0
971	0.0	0.0	0.0	971	0.0	0.0	0.0	971	0.0
981	0.0	0.0	0.0	981	0.0	0.0	0.0	981	0.0
991	0.0	0.0	0.0	991	0.0	0.0	0.0	991	0.0
1001	0.0	0.0	0.0	1001	0.0	0.0	0.0	1001	0.0

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Table E43
Speed Profile for UET

Primary Roads										Secondary Roads										Speed Profile for UEL										Trails										Off-Road												
PERCENT TOTAL DISTANCE										PERCENT TOTAL DISTANCE										PERCENT TOTAL DISTANCE										PERCENT TOTAL DISTANCE										PERCENT TOTAL DISTANCE												
X=0	2	4	6	8	10	12	14	16	18	X=0	2	4	6	8	10	12	14	16	18	X=0	2	4	6	8	10	12	14	16	18	X=0	2	4	6	8	10	12	14	16	18	X=0	2	4	6	8	10	12	14	16	18			
1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	
1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5
1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5
1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5
1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5
1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	1X 32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	1X 32.5	32.5	32.5	32.5	32.5</																			

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Table E44
Diagnostics Statistics for M561-M102

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails	
	Area Limited %	Average Speed mph		Area Limited %	Average Speed mph		Area Limited %	Average Speed mph
West Germany - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		0.	-
(2) INSUFFICIENT TRACTION	0.	-		0.	-		0.	-
(3) ROUGHNESS (PIED) SPEED LIMIT	0.	-		26.0	32.3		82.4	8.9
(4) SOIL/SLOPE RESISTANCES	65.8	44.3		21.0	20.7		8.0	9.4
(5) VISIBILITY LIMIT	0.	-		0.5	48.9		0.5	17.2
(6) ROAD CURVATURE	19.7	19.8		42.3	24.9		9.1	7.6
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7		10.2	12.1		0.	-
West Germany - Snow Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		0.	-
(2) INSUFFICIENT TRACTION	0.	-		0.	-		0.	-
(3) ROUGHNESS (PIED) SPEED LIMIT	0.	-		6.3	32.3		77.6	8.6
(4) SOIL/SLOPE RESISTANCES	64.5	25.5		57.1	21.7		13.3	12.6
(5) VISIBILITY LIMIT	8.3	39.0		4.6	35.5		0.2	16.2
(6) ROAD CURVATURE	12.7	15.3		21.7	13.2		8.9	7.4
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0		10.2	9.4		0.	-
Mid-East - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		0.	-
(2) INSUFFICIENT TRACTION	0.	-		0.	-		1.4	NO-GO
(3) ROUGHNESS (PIED) SPEED LIMIT	0.	-		33.0	32.3		85.3	10.6
(4) SOIL/SLOPE RESISTANCES	73.1	47.6		11.8	35.9		7.4	6.2
(5) VISIBILITY LIMIT	0.	-		0.	-		0.9	19.7
(6) ROAD CURVATURE	26.9	16.9		36.2	30.9		5.1	10.8
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-		19.0	12.6		0.	-
Mid-East - Sand Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		0.	-
(2) INSUFFICIENT TRACTION	0.	-		0.	-		29.5	NO-GO
(3) ROUGHNESS (PIED) SPEED LIMIT	0.	-		29.4	32.3		44.5	9.2
(4) SOIL/SLOPE RESISTANCES	72.4	47.8		5.5	29.1		23.3	11.4
(5) VISIBILITY LIMIT	0.	-		0.	-		0.1	19.8
(6) ROAD CURVATURE	27.6	16.3		46.1	25.7		2.5	8.4
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-		19.0	9.7		0.	-

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Table E45
Diagnostics Statistics for M561-YM204

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails		
	Area Limited %	Average Speed mph	Wet Condition	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph		
West Germany - Wet Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	0.	-		
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	1.5	NO-60		
(3) ROUGHNESS (RIPE) SPEED LIMIT	0.	-	-	23.4	32.3	80.4	8.8		
(4) SOIL/SLOPE RESISTANCES	65.9	43.4	-	24.2	19.8	8.5	13.1		
(5) VISIBILITY LIMIT	0.	-	-	0.5	48.9	0.6	18.7		
(6) ROAD CURVATURE	19.6	19.8	-	41.7	25.0	8.9	7.6		
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	-	10.2	12.1	0.	-		
West Germany - Snow Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	0.	-		
(2) INSUFFICIENT TRACTION	0.	-	-	0.4	NO-60	0.5	NO-60		
(3) ROUGHNESS (RIPE) SPEED LIMIT	0.	-	-	5.9	32.3	71.5	8.3		
(4) SOIL/SLOPE RESISTANCES	67.2	22.0	-	59.1	17.9	19.5	10.2		
(5) VISIBILITY LIMIT	8.3	36.4	-	6.3	33.4	0.4	16.8		
(6) ROAD CURVATURE	10.0	13.9	-	18.2	12.2	8.1	7.2		
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	-	10.2	9.4	0.	-		
Mid-East - Wet Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	0.	-		
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	7.2	NO-60		
(3) ROUGHNESS (RIPE) SPEED LIMIT	0.	-	-	27.0	32.3	78.6	10.7		
(4) SOIL/SLOPE RESISTANCES	73.4	44.7	-	18.9	28.1	8.5	13.3		
(5) VISIBILITY LIMIT	0.	-	-	0.	-	1.1	19.7		
(6) ROAD CURVATURE	26.6	16.8	-	35.1	30.8	4.6	9.6		
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	12.6	0.	-		
Mid-East - Sand Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	0.	-		
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	29.5	NO-60		
(3) ROUGHNESS (RIPE) SPEED LIMIT	0.	-	-	23.9	32.3	42.2	9.0		
(4) SOIL/SLOPE RESISTANCES	73.4	44.7	-	18.7	28.2	25.7	9.0		
(5) VISIBILITY LIMIT	0.	-	-	0.	-	0.1	19.2		
(6) ROAD CURVATURE	26.6	16.0	-	38.4	24.3	2.5	8.4		
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	9.7	0.	-		

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Table E46.
Diagnostics Statistics for M561-XM198

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails	
	Area Limited %	Average Speed mph	Wet Condition	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	
West Germany - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-	1.5	NO-GO	
(2) INSUFFICIENT TRACTION	0.	-		0.	-	7.1	NO-GO	
(3) ROUGHNESS (PIDE) SPEED LIMIT	0.	-		8.4	32.3	56.0	7.6	
(4) SOIL/SLOPE RESISTANCES	71.0	25.2		57.9	16.2	27.4	10.3	
(5) VISIBILITY LIMIT	0.	-		0.5	48.9	1.7	17.2	
(6) ROAD CURVATURE	14.5	17.6		23.0	20.0	6.3	6.5	
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7		10.2	12.1	0.	-	
West Germany - Snow Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-	0.	-	
(2) INSUFFICIENT TRACTION	19.1	NO-GO		32.1	NO-GO	44.5	NO-GO	
(3) ROUGHNESS (PIDE) SPEED LIMIT	0.	-		0.	-	28.6	6.8	
(4) SOIL/SLOPE RESISTANCES	62.3	13.9		48.4	12.6	23.4	9.4	
(5) VISIBILITY LIMIT	1.3	25.8		2.8	25.9	0.7	20.8	
(6) ROAD CURVATURE	2.8	10.3		6.5	10.1	2.8	6.2	
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0		10.2	9.4	0.	-	
Mid-East - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-	0.	-	
(2) INSUFFICIENT TRACTION	0.	-		0.	-	14.7	NO-GO	
(3) ROUGHNESS (PIDE) SPEED LIMIT	0.	-		5.4	32.3	53.9	9.2	
(4) SOIL/SLOPE RESISTANCES	79.6	28.2		64.6	23.9	27.2	11.1	
(5) VISIBILITY LIMIT	0.	-		0.	-	1.3	19.4	
(6) ROAD CURVATURE	20.4	14.5		11.0	20.7	2.9	8.2	
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-		19.0	12.6	0.	-	
Mid-East - Sand Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-	100.0	NO-GO	
(2) INSUFFICIENT TRACTION	0.	-		0.	-	0.	-	
(3) ROUGHNESS (PIDE) SPEED LIMIT	0.	-		4.4	32.3	0.	-	
(4) SOIL/SLOPE RESISTANCES	79.5	28.2		61.4	23.7	0.	-	
(5) VISIBILITY LIMIT	0.	-		0.	-	0.	-	
(6) ROAD CURVATURE	20.5	13.9		15.2	17.5	0.	-	
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-		19.0	9.7	0.	-	

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Table E47
Diagnostics Statistics for M35A2-M102

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails		
	Area Limited %	Average Speed mph	Wet Condition	Area Limited %	Average Speed mph	Wet Condition	Area Limited %	Average Speed mph	Wet Condition
West Germany - Wet Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	-	0.	-	-
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	-	0.	-	-
(3) ROUGHNESS (RIPE) SPEED LIMIT	0.	-	-	24.7	41.4	-	75.7	15.6	-
(4) SOIL/SLOPE RESISTANCES	66.1	46.9	-	21.3	20.0	-	10.5	11.8	-
(5) VISIBILITY LIMIT	0.	-	-	0.5	48.9	-	0.2	18.1	-
(6) ROAD CURVATURE	19.5	19.7	-	43.3	25.3	-	13.6	8.1	-
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	-	10.2	12.1	-	0.	-	-
West Germany - Snow Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	-	0.	-	-
(2) INSUFFICIENT TRACTION	0.	-	-	1.3	NO-GO	-	1.5	NO-GO	-
(3) ROUGHNESS (RIPE) SPEED LIMIT	0.	-	-	0.	-	-	16.8	14.9	-
(4) SOIL/SLOPE RESISTANCES	82.2	12.5	-	78.8	11.6	-	73.8	9.3	-
(5) VISIBILITY LIMIT	0.	-	-	1.1	35.6	-	0.	-	-
(6) ROAD CURVATURE	3.4	10.1	-	8.7	9.6	-	7.9	6.3	-
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	-	10.2	9.4	-	0.	-	-
Mid-East - Wet Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	-	0.	-	-
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	-	0.	-	-
(3) ROUGHNESS (RIPE) SPEED LIMIT	0.	-	-	29.4	41.4	-	80.2	16.3	-
(4) SOIL/SLOPE RESISTANCES	73.8	46.4	-	12.1	32.7	-	10.9	12.0	-
(5) VISIBILITY LIMIT	0.	-	-	0.	-	-	0.9	21.9	-
(6) ROAD CURVATURE	26.2	16.7	-	39.4	31.6	-	8.0	11.0	-
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	12.6	-	0.	-	-
Mid-East - Sand Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	-	0.	-	-
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	-	49.3	NO-GO	-
(3) ROUGHNESS (RIPE) SPEED LIMIT	0.	-	-	0.	-	-	20.3	14.6	-
(4) SOIL/SLOPE RESISTANCES	63.9	45.0	-	5.6	26.6	-	28.0	6.1	-
(5) VISIBILITY LIMIT	9.9	57.1	-	0.	-	-	0.1	20.7	-
(6) ROAD CURVATURE	26.2	15.9	-	75.4	29.7	-	2.4	8.7	-
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	9.7	-	0.	-	-

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Table E48

Diagnostics Statistics for M35A2-XM204

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails	
	Limited %	Average Speed mph	Area Limited %	Limited %	Average Speed mph	Area Limited %	Limited %	Average Speed mph
West Germany - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	0.	-	0.	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	0.	-	0.	0.	-
(3) ROUGHNESS (RIPE) SPEED LIMIT	0.	-	22.2	41.4	15.9	72.4	15.9	15.9
(4) SOIL/SLOPE RESISTANCES	66.1	45.8	35.3	24.4	11.8	14.0	11.8	11.8
(5) VISIBILITY LIMIT	0.	-	0.5	48.9	17.7	0.3	17.7	17.7
(6) ROAD CURVATURE	19.5	19.7	31.8	21.5	8.1	13.3	8.1	8.1
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	10.2	12.1	-	0.	-	-
West Germany - Snow Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	0.	-	0.	0.	-
(2) INSUFFICIENT TRACTION	0.	-	2.9	NO-GO	NO-GO	4.7	NO-GO	NO-GO
(3) ROUGHNESS (RIPE) SPEED LIMIT	0.	-	0.	-	-	13.8	14.9	14.9
(4) SOIL/SLOPE RESISTANCES	83.4	11.6	79.6	10.8	8.8	74.1	8.8	8.8
(5) VISIBILITY LIMIT	0.	-	0.7	34.9	-	0.	-	-
(6) ROAD CURVATURE	2.1	9.4	6.6	9.1	6.2	7.4	6.2	6.2
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	10.2	9.4	-	0.	-	-
Mid-East - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	-	0.	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	-	0.1	NO-GO	NO-GO
(3) ROUGHNESS (RIPE) SPEED LIMIT	0.	-	23.9	41.4	16.3	78.6	16.3	16.3
(4) SOIL/SLOPE RESISTANCES	74.1	44.0	27.8	36.6	11.9	12.4	11.9	11.9
(5) VISIBILITY LIMIT	0.	-	0.	-	-	1.0	20.9	20.9
(6) ROAD CURVATURE	25.9	16.6	29.3	28.1	10.9	7.8	10.9	10.9
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	12.6	-	0.	-	-
Mid-East - Sand Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	-	0.	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	-	49.3	NO-GO	NO-GO
(3) ROUGHNESS (RIPE) SPEED LIMIT	0.	-	0.	-	-	20.3	14.6	14.6
(4) SOIL/SLOPE RESISTANCES	64.2	42.4	17.2	33.4	1.6	28.5	1.6	1.6
(5) VISIBILITY LIMIT	9.9	57.1	0.	-	20.5	0.1	20.5	20.5
(6) ROAD CURVATURE	25.9	15.8	63.8	28.5	7.9	1.9	7.9	7.9
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	9.7	-	0.	-	-

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Table E49
Diagnostics Statistics for M3SA2-XM198

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails		
	Area Limited %	Average Speed mph	West Germany - Wet Condition	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-	1.5	NO-GO		
(2) INSUFFICIENT TRACTION	0.	-		0.	-	2.9	NO-GO		
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		10.5	41.4	58.8	15.7		
(4) SOIL/SLOPE RESISTANCES	68.8	33.0		54.0	18.8	24.6	10.4		
(5) VISIBILITY LIMIT	0.	-		0.5	48.9	0.8	18.3		
(6) ROAD CURVATURE	16.8	18.4		24.8	20.0	11.5	7.8		
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7		10.2	12.1	0.	-		
West Germany - Snow Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-	0.	-		
(2) INSUFFICIENT TRACTION	22.3	NO-GO		39.4	NO-GO	54.8	NO-GO		
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		0.	-	0.	-		
(4) SOIL/SLOPE RESISTANCES	63.2	7.9		49.3	7.7	43.6	6.2		
(5) VISIBILITY LIMIT	0.	-		0.	-	0.	-		
(6) ROAD CURVATURE	0.	-		1.1	6.6	1.6	5.1		
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0		10.2	9.4	0.	-		
Mid-East - Wet Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-	0.	-		
(2) INSUFFICIENT TRACTION	0.	-		0.	-	8.2	NO-GO		
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		10.0	41.4	60.7	15.9		
(4) SOIL/SLOPE RESISTANCES	77.0	33.7		56.1	27.9	23.4	11.1		
(5) VISIBILITY LIMIT	0.	-		0.	-	1.5	22.4		
(6) ROAD CURVATURE	23.0	15.5		14.9	22.4	6.2	10.3		
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-		19.9	12.6	0.	-		
Mid-East - Sand Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-	98.7	NO-GO		
(2) INSUFFICIENT TRACTION	0.	-		0.	-	0.9	NO-GO		
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		0.	-	0.1	17.0		
(4) SOIL/SLOPE RESISTANCES	67.2	31.7		45.0	26.6	0.3	1.8		
(5) VISIBILITY LIMIT	9.9	57.1		0.	-	0.	-		
(6) ROAD CURVATURE	23.0	14.8		36.0	24.2	0.	-		
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-		19.0	9.7	0.	-		

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Table E50
Diagnostics Statistics for M813-XM204

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails	
	Area Limited %	Average Speed mph	Wet Condition	Area Limited %	Average Speed mph	Wet Condition	Area Limited %	Average Speed mph
West Germany - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	-	1.5	NO-GO
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	-	0.	-
(3) ROUGHNESS (PIKE) SPEED LIMIT	0.	-	-	22.2	44.4	-	71.8	9.7
(4) SOIL/SLOPE RESISTANCES	66.2	41.1	-	45.0	25.0	-	15.4	11.2
(5) VISIBILITY LIMIT	0.	-	-	0.4	48.7	-	0.3	25.8
(6) ROAD CURVATURE	19.3	19.6	-	22.2	17.4	-	11.0	8.6
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	-	10.2	12.1	-	0.	-
West Germany - Snow Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	-	0.	NO-GO
(2) INSUFFICIENT TRACTION	0.	-	-	0.4	NO-GO	-	0.5	NO-GO
(3) ROUGHNESS (PIKE) SPEED LIMIT	0.	-	-	0.	-	-	31.0	6.8
(4) SOIL/SLOPE RESISTANCES	83.3	10.9	-	81.8	10.3	-	63.1	8.4
(5) VISIBILITY LIMIT	0.	-	-	1.3	35.3	-	0.1	18.8
(6) ROAD CURVATURE	2.2	9.7	-	6.4	9.4	-	5.3	6.6
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	-	10.2	9.4	-	0.	-
Mid-East - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	-	0.	-
(3) ROUGHNESS (PIKE) SPEED LIMIT	0.	-	-	23.9	44.4	-	75.9	11.2
(4) SOIL/SLOPE RESISTANCES	74.2	41.3	-	34.0	38.0	-	14.7	11.4
(5) VISIBILITY LIMIT	0.	-	-	0.	-	-	1.5	26.5
(6) ROAD CURVATURE	25.8	16.6	-	23.1	25.2	-	7.9	12.4
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	12.6	-	0.	-
Mid-East - Sand Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	-	0.	NO-GO
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	-	49.3	7.3
(3) ROUGHNESS (PIKE) SPEED LIMIT	0.	-	-	0.	-	-	18.7	10.5
(4) SOIL/SLOPE RESISTANCES	74.2	41.3	-	17.2	32.5	-	30.3	21.4
(5) VISIBILITY LIMIT	0.	-	-	0.	-	-	0.1	8.3
(6) ROAD CURVATURE	25.8	15.8	-	63.8	28.5	-	1.7	-
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	9.7	-	0.	-

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Table ES1

Diagnostics Statistics for M813-M114A1

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails	
	Area Limited %	Average Speed mph	Wet Condition	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	
West Germany - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	1.5	NO-GO	
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.	-	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	10.5	44.4	61.5	8.8	
(4) SOIL/SLOPE RESISTANCES	68.4	34.4	-	59.1	22.8	26.8	12.6	
(5) VISIBILITY LIMIT	0.	-	-	0.4	48.7	1.0	24.2	
(6) ROAD CURVATURE	17.1	18.6	-	19.8	16.8	10.0	8.2	
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	-	10.2	12.1	0.	-	
West Germany - Snow Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	8.	NO-GO	
(2) INSUFFICIENT TRACTION	0.	-	-	5.2	NO-GO	6.1	NO-GO	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	0.	-	25.4	5.7	
(4) SOIL/SLOPE RESISTANCES	84.7	8.5	-	81.0	8.3	65.2	6.9	
(5) VISIBILITY LIMIT	0.	-	-	0.2	33.3	0.1	17.3	
(6) ROAD CURVATURE	0.8	10.2	-	3.5	8.8	3.2	5.8	
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	-	10.2	9.4	0.	-	
Mid-East - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	0.	-	
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.1	NO-GO	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	10.0	44.4	61.9	10.1	
(4) SOIL/SLOPE RESISTANCES	76.0	36.6	-	53.4	32.0	29.0	12.5	
(5) VISIBILITY LIMIT	0.	-	-	0.	-	2.3	23.9	
(6) ROAD CURVATURE	24.0	15.9	-	17.6	23.3	6.8	11.5	
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	12.6	0.	-	
Mid-East - Sand Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	98.7	NO-GO	
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.9	NO-GO	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	0.	-	0.1	15.4	
(4) SOIL/SLOPE RESISTANCES	76.0	36.6	-	41.5	30.4	0.3	6.3	
(5) VISIBILITY LIMIT	0.	-	-	0.	-	0.	-	
(6) ROAD CURVATURE	24.0	15.2	-	39.5	24.6	0.	-	
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	9.7	0.	-	

Table E52
Diagnostics Statistics for M813-XM198

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails		
	Area Limited %	Average Speed mph	Wet Condition	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph		
West Germany - Wet Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	1.5	NO-GO		
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.	-		
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	10.5	44.4	59.6	8.7		
(4) SOIL/SLOPE RESISTANCES	68.7	32.7	-	59.4	22.0	28.2	12.2		
(5) VISIBILITY LIMIT	0.	-	-	0.4	48.7	1.2	21.9		
(6) ROAD CURVATURE	16.9	18.5	-	19.5	16.8	9.5	8.8		
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	-	10.2	12.1	0.	-		
West Germany - Snow Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	0.	-		
(2) INSUFFICIENT TRACTION	0.	-	-	6.1	NO-GO	6.5	NO-GO		
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	0.	-	22.9	5.4		
(4) SOIL/SLOPE RESISTANCES	85.1	6.9	-	81.5	0.	68.5	8.		
(5) VISIBILITY LIMIT	0.	-	-	0.	-	0.1	16.6		
(6) ROAD CURVATURE	0.4	9.0	-	2.2	9.5	1.9	6.2		
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	-	10.2	9.4	0.	-		
Mid-East - Wet Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	0.	-		
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.1	NO-GO		
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	10.0	44.4	59.9	10.0		
(4) SOIL/SLOPE RESISTANCES	76.7	35.2	-	53.4	30.6	31.3	10.2		
(5) VISIBILITY LIMIT	0.	-	-	0.	-	2.4	22.5		
(6) ROAD CURVATURE	23.3	15.6	-	17.6	23.3	6.4	11.3		
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	12.6	0.	-		
Mid-East - Sand Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	98.7	NO-GO		
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.9	NO-GO		
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	0.	-	0.1	11.8		
(4) SOIL/SLOPE RESISTANCES	76.7	35.1	-	41.5	29.2	0.3	5.7		
(5) VISIBILITY LIMIT	0.	-	-	0.	-	0.	-		
(6) ROAD CURVATURE	23.3	14.9	-	39.5	24.6	0.	-		
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	9.7	0.	-		

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Table E53
Diagnostics Statistics for M813-FH70

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails	
	Area Limited %	Average Speed mph	Wet Condition	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	
West Germany - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	96.2	NO-GO	
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.	-	
(3) ROUGHNESS (PIDE) SPEED LIMIT	0.	-	-	8.0	44.4	2.6	9.1	
(4) SOIL/SLOPE RESISTANCES	69.1	30.5	-	63.2	20.6	1.0	10.8	
(5) VISIBILITY LIMIT	0.	-	-	0.4	48.7	0.	-	
(6) ROAD CURVATURE	16.4	18.4	-	18.2	16.3	0.3	5.7	
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	-	10.2	12.1	0.	-	
West Germany - Snow Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	0.	-	
(2) INSUFFICIENT TRACTION	0.	-	-	18.1	NO-GO	25.9	NO-GO	
(3) ROUGHNESS (PIDE) SPEED LIMIT	0.	-	-	0.	-	15.5	5.0	
(4) SOIL/SLOPE RESISTANCES	85.2	6.7	-	70.9	6.8	57.4	5.8	
(5) VISIBILITY LIMIT	0.	-	-	0.	-	0.	-	
(6) ROAD CURVATURE	0.3	8.5	-	0.8	7.7	1.2	5.8	
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	-	10.2	9.4	0.	-	
Mid-East - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	98.7	NO-GO	
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.	-	
(3) ROUGHNESS (PIDE) SPEED LIMIT	0.	-	-	4.4	44.4	0.7	17.5	
(4) SOIL/SLOPE RESISTANCES	77.0	32.4	-	61.7	28.2	0.5	7.4	
(5) VISIBILITY LIMIT	0.	-	-	0.	-	0.	-	
(6) ROAD CURVATURE	23.0	15.5	-	14.8	22.3	0.1	9.4	
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	12.6	0.	-	
Mid-East - Sand Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	100.0	NO-GO	
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.	-	
(3) ROUGHNESS (PIDE) SPEED LIMIT	0.	-	-	0.	-	0.	-	
(4) SOIL/SLOPE RESISTANCES	77.0	32.4	-	45.0	26.0	0.	-	
(5) VISIBILITY LIMIT	0.	-	-	0.	-	0.	-	
(6) ROAD CURVATURE	23.0	14.8	-	36.0	24.2	0.	-	
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	9.7	0.	-	

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Table E54

Diagnostics Statistics for M813-XM(130 mm)

Factors Limiting Speed	Primary Roads		Secondary Roads		Trails	
	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph
West Germany - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	1.5	NO-GO
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (WIDE) SPEED LIMIT	0.	-	10.5	44.4	59.2	8.6
(4) SOIL/SLOPE RESISTANCES	68.7	31.5	59.4	21.4	28.7	11.7
(5) VISIBILITY LIMIT	0.	-	0.4	48.7	1.1	23.0
(6) ROAD CURVATURE	16.8	18.6	19.5	16.8	9.5	8.8
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	10.2	12.1	0.	-
West Germany - Snow Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	NO-GO
(2) INSUFFICIENT TRACTION	0.	-	6.5	NO-GO	7.0	NO-GO
(3) ROUGHNESS (WIDE) SPEED LIMIT	0.	-	0.	-	20.4	5.4
(4) SOIL/SLOPE RESISTANCES	85.2	6.8	81.4	6.6	70.7	5.5
(5) VISIBILITY LIMIT	0.	-	0.	-	0.1	16.3
(6) ROAD CURVATURE	0.3	8.5	1.9	9.0	1.8	6.8
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	10.2	9.4	0.	-
Mid-East - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.1	NO-GO
(3) ROUGHNESS (WIDE) SPEED LIMIT	0.	-	10.0	44.4	58.4	9.8
(4) SOIL/SLOPE RESISTANCES	76.7	34.1	53.4	29.5	33.0	9.7
(5) VISIBILITY LIMIT	0.	-	0.	-	2.3	22.9
(6) ROAD CURVATURE	23.3	15.6	17.6	23.3	6.2	11.2
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	12.6	0.	-
Mid-East - Sand Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	98.7	NO-GO
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.9	NO-GO
(3) ROUGHNESS (WIDE) SPEED LIMIT	0.	-	0.	-	0.1	11.8
(4) SOIL/SLOPE RESISTANCES	76.7	34.1	41.6	28.0	0.3	8.9
(5) VISIBILITY LIMIT	0.	-	0.	-	0.	-
(6) ROAD CURVATURE	23.3	14.9	39.4	24.6	0.	-
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	9.7	0.	-

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Table E55
Diagnostics Statistics for M656-XM204

Factors Limiting Speed	Primary Roads		Secondary Roads		Trails	
	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph
West Germany - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (PIDE) SPEED LIMIT	28.7	47.5	35.8	37.4	73.6	13.1
(4) SOIL/SLOPE RESISTANCES	39.0	34.4	33.0	22.1	13.5	12.4
(5) VISIBILITY LIMIT	0.	-	0.	-	0.4	19.5
(6) ROAD CURVATURE	17.8	18.9	21.0	16.8	12.4	7.9
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	10.2	12.1	0.	-
West Germany - Snow Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (PIDE) SPEED LIMIT	0.	-	6.8	34.7	61.4	12.1
(4) SOIL/SLOPE RESISTANCES	67.0	22.0	57.4	18.7	26.5	13.3
(5) VISIBILITY LIMIT	8.3	41.5	1.5	35.2	0.1	19.1
(6) ROAD CURVATURE	10.2	14.0	24.1	14.5	12.0	7.7
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	10.2	9.4	0.	-
Mid-East - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.1	NO-GO
(3) ROUGHNESS (PIDE) SPEED LIMIT	33.9	47.5	39.0	36.2	77.2	13.5
(4) SOIL/SLOPE RESISTANCES	41.2	36.3	21.9	34.9	13.6	11.4
(5) VISIBILITY LIMIT	0.	-	0.	-	1.5	20.7
(6) ROAD CURVATURE	24.9	16.1	20.1	23.8	7.6	11.0
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	12.6	0.	-
Mid-East - Sand Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	29.5	NO-GO
(3) ROUGHNESS (PIDE) SPEED LIMIT	32.4	47.5	29.4	34.7	34.2	11.1
(4) SOIL/SLOPE RESISTANCES	41.2	36.3	11.6	30.0	33.2	9.2
(5) VISIBILITY LIMIT	0.	-	0.	-	0.3	23.3
(6) ROAD CURVATURE	26.5	16.0	39.9	24.5	2.7	8.3
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	9.7	0.	-

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Table E56
Diagnostics Statistics for M656-YM198

Factors Limiting Speed	Primary Roads		Secondary Roads		Trails	
	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph
West Germany - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	1.5	NO-GO
(3) ROUGHNESS (RIPE) SPEED LIMIT	5.7	47.5	18.2	38.8	62.9	12.8
(4) SOIL/SLOPE RESISTANCES	63.2	31.2	52.4	19.9	23.2	8.8
(5) VISIBILITY LIMIT	0.	-	0.	-	1.3	20.2
(6) ROAD CURVATURE	16.6	18.3	19.1	16.5	11.0	7.6
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	10.2	12.1	0.	-
West Germany - Snow Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	1.3	NO-GO	1.5	NO-GO
(3) ROUGHNESS (RIPE) SPEED LIMIT	0.	-	1.8	34.7	47.5	11.8
(4) SOIL/SLOPE RESISTANCES	74.2	15.2	65.0	13.3	40.6	9.2
(5) VISIBILITY LIMIT	6.3	34.6	8.1	32.2	1.2	20.5
(6) ROAD CURVATURE	5.1	12.0	13.6	11.4	9.1	6.8
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	10.2	9.4	0.	-
Mid-East - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	7.2	NO-GO
(3) ROUGHNESS (RIPE) SPEED LIMIT	17.0	47.5	11.4	34.7	61.8	12.9
(4) SOIL/SLOPE RESISTANCES	60.5	31.0	52.5	29.7	22.8	9.8
(5) VISIBILITY LIMIT	0.	-	0.	-	1.9	22.1
(6) ROAD CURVATURE	22.5	15.3	17.1	22.7	6.3	10.4
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	12.6	0.	-
Mid-East - Sand Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	98.7	NO-GO
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.9	NO-GO
(3) ROUGHNESS (RIPE) SPEED LIMIT	16.2	47.5	10.0	34.7	0.2	13.6
(4) SOIL/SLOPE RESISTANCES	60.5	31.0	41.9	28.2	0.2	7.6
(5) VISIBILITY LIMIT	0.	-	0.	-	0.	-
(6) ROAD CURVATURE	23.3	14.9	29.1	21.8	0.	-
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	9.7	0.	-

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Table E57
Diagnostics Statistics for TDM901-XM204

Factors Limiting Speed	Primary Roads		Secondary Roads		Trails	
	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph
West Germany - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (SIDE) SPEED LIMIT	0.	-	0.	43.0	45.0	17.6
(4) SOIL/SLOPE RESISTANCES	71.2	27.0	58.9	16.7	41.4	11.0
(5) VISIBILITY LIMIT	0.	-	0.5	48.9	0.2	19.1
(6) ROAD CURVATURE	14.4	17.3	22.5	19.7	12.6	7.9
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	10.2	12.1	0.	-
West Germany - Snow Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (SIDE) SPEED LIMIT	0.	-	0.	-	44.7	17.6
(4) SOIL/SLOPE RESISTANCES	68.8	16.8	59.9	14.4	43.4	10.9
(5) VISIBILITY LIMIT	9.2	42.9	1.4	35.8	0.1	20.7
(6) ROAD CURVATURE	7.6	13.0	28.6	17.1	11.7	7.6
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	10.2	9.4	0.	-
Mid-East - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (SIDE) SPEED LIMIT	0.	-	4.4	43.0	48.3	16.2
(4) SOIL/SLOPE RESISTANCES	79.6	27.4	66.3	23.4	43.6	11.6
(5) VISIBILITY LIMIT	0.	-	0.	-	1.0	23.5
(6) ROAD CURVATURE	20.4	14.5	10.2	20.8	7.1	10.4
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	12.6	0.	-
Mid-East - Sand Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	15.5	NO-GO
(3) ROUGHNESS (SIDE) SPEED LIMIT	0.	-	0.	-	16.0	19.3
(4) SOIL/SLOPE RESISTANCES	79.5	27.4	59.0	23.1	65.1	7.5
(5) VISIBILITY LIMIT	0.	-	0.	-	0.3	24.6
(6) ROAD CURVATURE	20.5	13.9	22.0	20.3	3.1	8.5
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	9.7	0.	-

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Table E58

Diagnostics Statistics for TDW901-M114A1

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails	
	Limited %	Average Speed mph	Wet Condition	Limited %	Average Speed mph	Area Limited %	Area Limited %	Average Speed mph
West Germany - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	0.	0.	-
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.	0.	-
(3) ROAD/STREET RESISTANCES	75.2	22.3	-	8.0	43.0	42.2	42.2	17.6
(4) SOIL/STREET RESISTANCES	0.	-	-	63.0	14.0	45.5	45.5	9.1
(5) VISIBILITY LIMIT	0.	-	-	0.5	48.9	0.8	0.8	21.7
(6) ROAD CURVATURE	10.4	15.6	-	18.4	19.3	11.5	11.5	7.6
(7) EXTERNAL (OBSTACLE) SPEED LIMIT	14.5	13.7	-	10.2	12.1	0.	0.	-
West Germany - Snow Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	0.	0.	-
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.	0.	-
(3) ROAD/STREET RESISTANCES	69.2	14.7	-	62.7	12.4	42.7	42.7	17.4
(4) SOIL/STREET RESISTANCES	9.2	39.4	-	9.2	36.6	45.2	45.2	9.4
(5) VISIBILITY LIMIT	7.1	13.0	-	18.0	13.9	11.3	11.3	22.7
(6) ROAD CURVATURE	14.5	13.0	-	10.2	9.4	0.	0.	7.5
(7) EXTERNAL (OBSTACLE) SPEED LIMIT	14.5	13.0	-	10.2	9.4	0.	0.	-
Mid-East - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	0.	0.	-
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.1	0.1	NO-GO
(3) ROAD/STREET RESISTANCES	82.8	23.0	-	4.4	43.0	41.7	41.7	15.9
(4) SOIL/STREET RESISTANCES	0.	-	-	70.3	19.1	50.9	50.9	9.9
(5) VISIBILITY LIMIT	0.	-	-	0.	-	1.6	1.6	21.5
(6) ROAD CURVATURE	17.2	13.5	-	6.2	19.1	5.8	5.8	9.7
(7) EXTERNAL (OBSTACLE) SPEED LIMIT	0.	-	-	19.0	12.6	0.	0.	-
Mid-East - Sand Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	0.	0.	-
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	20.3	20.3	NO-GO
(3) ROAD/STREET RESISTANCES	82.4	23.0	-	0.	-	13.6	13.6	19.3
(4) SOIL/STREET RESISTANCES	0.	-	-	65.9	19.0	63.2	63.2	5.8
(5) VISIBILITY LIMIT	0.	-	-	0.	-	0.4	0.4	24.3
(6) ROAD CURVATURE	17.6	13.0	-	15.1	19.4	2.4	2.4	8.4
(7) EXTERNAL (OBSTACLE) SPEED LIMIT	0.	-	-	19.0	9.7	0.	0.	-

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Table E59
Diagnostics Statistics for TDM901-XM198

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails		
	Area Limited %	Average Speed mph		Area Limited %	Average Speed mph		Area Limited %	Average Speed mph	
West Germany - Wet Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		0.	-	
(2) INSUFFICIENT TRACTION	0.	-		0.	-		0.	-	
(3) ROUGHNESS (PIRE) SPEED LIMIT	0.	-		7.0	43.0		41.7	17.5	
(4) SOIL/SLOPE RESISTANCES	75.2	21.1		64.3	13.7		46.1	8.5	
(5) VISIBILITY LIMIT	0.	-		0.5	48.9		8.9	21.0	
(6) ROAD CURVATURE	10.3	15.6		18.0	19.4		11.2	7.5	
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7		10.2	12.1		0.	-	
West Germany - Snow Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		0.	-	
(2) INSUFFICIENT TRACTION	0.	-		0.	-		0.	-	
(3) ROUGHNESS (PIRE) SPEED LIMIT	0.	-		0.	-		32.6	17.8	
(4) SOIL/SLOPE RESISTANCES	69.2	14.2		62.8	11.9		55.2	9.7	
(5) VISIBILITY LIMIT	9.2	38.1		10.3	35.4		1.1	21.9	
(6) ROAD CURVATURE	7.1	13.0		16.7	13.4		11.2	7.5	
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0		10.2	9.4		0.	-	
Mid-East - Wet Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		0.	-	
(2) INSUFFICIENT TRACTION	0.	-		0.	-		0.1	NO-60	
(3) ROUGHNESS (PIRE) SPEED LIMIT	0.	-		2.5	43.0		40.9	15.7	
(4) SOIL/SLOPE RESISTANCES	83.1	22.0		73.1	18.8		51.8	9.0	
(5) VISIBILITY LIMIT	0.	-		0.	-		1.9	21.2	
(6) ROAD CURVATURE	16.9	13.4		5.4	18.3		5.4	9.4	
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-		19.0	12.6		0.	-	
Mid-East - Sand Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		98.7	NO-60	
(2) INSUFFICIENT TRACTION	0.	-		0.	-		0.9	NO-60	
(3) ROUGHNESS (PIRE) SPEED LIMIT	0.	-		0.	-		0.1	19.5	
(4) SOIL/SLOPE RESISTANCES	82.8	22.0		65.9	18.3		0.3	7.2	
(5) VISIBILITY LIMIT	0.	-		0.	-		0.	-	
(6) ROAD CURVATURE	17.2	12.9		15.1	19.4		0.	-	
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-		19.0	9.7		0.	-	

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Table E60

Diagnostics Statistics for TDM901-PH70

Factors Limiting Speed	Primary Roads		Secondary Roads		Trails	
	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph
West Germany - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	96.2	NO-GO
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIPE) SPEED LIMIT	0.	-	7.0	43.0	1.2	16.1
(4) SOIL/SLOPE RESISTANCES	77.2	19.2	64.7	12.8	2.4	9.6
(5) VISIBILITY LIMIT	0.	-	0.5	48.9	0.	-
(6) ROAD CURVATURE	8.3	14.5	17.6	19.5	0.3	5.9
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	10.2	12.1	0.	-
West Germany - Snow Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIPE) SPEED LIMIT	0.	-	0.	-	25.7	18.5
(4) SOIL/SLOPE RESISTANCES	71.4	13.3	64.3	11.0	64.0	9.2
(5) VISIBILITY LIMIT	9.2	36.5	13.6	34.7	1.2	28.6
(6) ROAD CURVATURE	4.9	12.3	11.9	11.2	9.1	7.8
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	10.2	9.4	0.	-
Mid-East - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	98.7	NO-GO
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIPE) SPEED LIMIT	0.	-	2.5	43.0	0.4	21.8
(4) SOIL/SLOPE RESISTANCES	84.3	20.2	73.8	17.7	0.8	6.9
(5) VISIBILITY LIMIT	0.	-	0.	-	0.	-
(6) ROAD CURVATURE	15.7	12.9	4.6	17.5	0.1	7.6
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	12.6	0.	-
Mid-East - Sand Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	98.7	NO-GO
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.9	NO-GO
(3) ROUGHNESS (RIPE) SPEED LIMIT	0.	-	0.	-	0.1	16.3
(4) SOIL/SLOPE RESISTANCES	83.1	20.2	67.8	17.3	0.3	7.6
(5) VISIBILITY LIMIT	0.	-	0.	-	0.	-
(6) ROAD CURVATURE	16.9	12.8	13.2	19.2	0.	-
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	9.7	0.	-

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Table E61
Diagnostics Statistics for TDW901-XM(130 mm)

Factors Limiting Speed	Primary Roads		Secondary Roads		Trails	
	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph
	West Germany - Wet Condition					
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	1.5	MN-60
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIPE) SPEED LIMIT	0.	-	7.0	43.0	26.6	18.5
(4) SOIL/SLOPE RESISTANCES	75.2	20.4	64.6	13.4	59.8	9.7
(5) VISIBILITY LIMIT	0.	-	8.5	48.9	0.8	21.8
(6) ROAD CURVATURE	10.3	15.6	17.7	19.5	11.2	7.5
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	10.2	12.1	0.	-
West Germany - Snow Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIPE) SPEED LIMIT	0.	-	0.	-	32.5	17.8
(4) SOIL/SLOPE RESISTANCES	71.3	13.9	64.2	11.6	55.2	9.4
(5) VISIBILITY LIMIT	9.2	37.6	12.2	35.5	1.2	21.3
(6) ROAD CURVATURE	5.0	12.2	13.4	12.1	11.1	7.5
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	10.2	9.4	0.	-
Mid-East - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.1	MN-60
(3) ROUGHNESS (RIPE) SPEED LIMIT	0.	-	2.5	43.0	26.3	18.9
(4) SOIL/SLOPE RESISTANCES	83.1	21.4	73.4	18.4	66.6	9.0
(5) VISIBILITY LIMIT	0.	-	0.	-	1.7	21.3
(6) ROAD CURVATURE	16.9	13.4	5.1	18.5	5.3	9.4
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	12.6	0.	-
Mid-East - Sand Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	98.7	MN-60
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.9	MN-60
(3) ROUGHNESS (RIPE) SPEED LIMIT	0.	-	0.	-	0.1	19.5
(4) SOIL/SLOPE RESISTANCES	83.1	21.4	65.9	17.9	0.3	7.8
(5) VISIBILITY LIMIT	0.	-	0.	-	0.	-
(6) ROAD CURVATURE	16.9	12.8	15.1	19.4	0.	-
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	9.7	0.	-

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Table E62
Diagnostics Statistics for MS20E1-XM204

Factors Limiting Speed	Primary Roads		Secondary Roads		Trails	
	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph
West Germany - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	1.5	N0-00
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (WIDE) SPEED LIMIT	0.	-	27.1	21.6	75.7	8.5
(4) SOIL/SLOPE RESISTANCES	73.8	24.4	50.4	15.5	15.8	7.1
(5) VISIBILITY LIMIT	0.	-	0.	-	0.	-
(6) ROAD CURVATURE	11.7	15.6	12.3	13.8	7.8	5.9
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	10.2	12.1	0.	-
West Germany - Snow Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (WIDE) SPEED LIMIT	0.	-	7.8	21.6	71.2	8.3
(4) SOIL/SLOPE RESISTANCES	81.0	14.9	70.3	12.3	22.2	6.8
(5) VISIBILITY LIMIT	0.	-	0.	-	0.	-
(6) ROAD CURVATURE	4.6	11.4	11.8	10.8	6.6	5.9
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	10.2	9.4	0.	-
Mid-East - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (WIDE) SPEED LIMIT	0.	-	32.1	21.6	82.9	8.9
(4) SOIL/SLOPE RESISTANCES	86.4	25.0	43.1	22.3	14.5	6.3
(5) VISIBILITY LIMIT	0.	-	0.	-	0.	-
(6) ROAD CURVATURE	13.6	11.3	5.7	16.8	2.6	6.8
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	12.6	0.	-
Mid-East - Sand Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	14.7	N0-00
(3) ROUGHNESS (WIDE) SPEED LIMIT	0.	-	29.6	21.6	29.1	7.8
(4) SOIL/SLOPE RESISTANCES	84.7	24.9	38.7	22.0	55.1	5.2
(5) VISIBILITY LIMIT	0.	-	0.	-	0.	-
(6) ROAD CURVATURE	15.3	11.6	12.7	16.0	1.2	5.7
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	9.7	0.	-

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Table E63
Diagnostics Statistics for MS20E1-XM198

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails	
	Area Limited %	Average Speed mph		Area Limited %	Average Speed mph		Area Limited %	Average Speed mph
West Germany - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		1.5	N0-80
(2) INSUFFICIENT TRACTION	0.	-		0.	-		0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		12.8	21.6		67.6	8.4
(4) SOIL/SLOPE RESISTANCES	76.5	21.0		66.4	13.8		24.4	6.1
(5) VISIBILITY LIMIT	0.	-		0.	-		0.	-
(6) ROAD CURVATURE	9.0	14.3		10.6	13.4		6.4	5.9
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7		10.2	12.1		0.	-
West Germany - Snow Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		0.	-
(2) INSUFFICIENT TRACTION	0.	-		0.	-		0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		7.4	21.6		56.1	8.8
(4) SOIL/SLOPE RESISTANCES	81.3	11.7		74.2	9.8		30.3	6.1
(5) VISIBILITY LIMIT	0.	-		0.4	28.5		0.	-
(6) ROAD CURVATURE	4.2	11.3		7.8	10.0		5.6	5.7
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0		10.2	9.4		0.	-
Mid-East - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		0.	-
(2) INSUFFICIENT TRACTION	0.	-		0.	-		0.1	N0-60
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		13.6	21.6		70.3	8.6
(4) SOIL/SLOPE RESISTANCES	87.9	22.1		63.4	19.3		27.2	5.8
(5) VISIBILITY LIMIT	0.	-		0.	-		0.1	13.7
(6) ROAD CURVATURE	12.1	10.7		4.0	15.1		2.4	6.7
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-		19.0	12.6		0.	-
Mid-East - Sand Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		0.	-
(2) INSUFFICIENT TRACTION	0.	-		0.	-		15.5	N0-60
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		12.5	21.6		22.3	7.4
(4) SOIL/SLOPE RESISTANCES	85.9	21.9		60.0	19.2		61.1	3.6
(5) VISIBILITY LIMIT	0.	-		0.	-		0.	-
(6) ROAD CURVATURE	14.1	11.3		8.5	14.5		1.0	5.7
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-		19.0	9.7		0.	-

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Table E64
Diagnostics Statistics for M520E1-FH70

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails	
	Area Limited %	Average Speed mph	Condition	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	
West Germany - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-	96.2	NO-GO	
(2) INSUFFICIENT TRACTION	0.	-		0.	-	0.	-	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		12.6	21.6	2.5	7.4	
(4) SOIL/SLOPE RESISTANCES	76.5	20.0		67.8	13.1	1.2	6.1	
(5) VISIBILITY LIMIT	0.	-		0.	-	0.	-	
(6) ROAD CURVATURE	9.0	14.3		9.2	12.9	0.2	3.0	
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7		10.2	12.1	0.	-	
West Germany - Snow Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-	0.	-	
(2) INSUFFICIENT TRACTION	0.	-		0.	-	0.	-	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		7.4	21.6	55.6	8.8	
(4) SOIL/SLOPE RESISTANCES	81.4	11.2		74.2	9.3	39.0	5.7	
(5) VISIBILITY LIMIT	0.	-		0.5	26.6	0.	-	
(6) ROAD CURVATURE	4.2	11.3		7.7	10.0	5.3	5.7	
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0		10.2	9.4	0.	-	
Mid-East - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-	98.7	NO-GO	
(2) INSUFFICIENT TRACTION	0.	-		0.	-	0.	-	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		13.6	21.6	0.7	10.8	
(4) SOIL/SLOPE RESISTANCES	88.2	21.4		64.2	18.2	0.5	6.6	
(5) VISIBILITY LIMIT	0.	-		0.	-	0.	-	
(6) ROAD CURVATURE	11.8	10.6		3.2	14.3	0.1	7.2	
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-		19.0	12.6	0.	-	
Mid-East - Sand Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-	100.0	NO-GO	
(2) INSUFFICIENT TRACTION	0.	-		0.	-	0.	-	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		12.5	21.6	0.	-	
(4) SOIL/SLOPE RESISTANCES	86.2	21.3		60.0	18.0	0.	-	
(5) VISIBILITY LIMIT	0.	-		0.	-	0.	-	
(6) ROAD CURVATURE	13.8	11.1		8.5	14.5	0.	-	
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-		19.0	9.7	0.	-	

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Table E65
Diagnostics Statistics for M12SE1-XM198

Factors Limiting Speed	Primary Roads		Secondary Roads		Trails	
	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph
West Germany - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	1.5	N0-60
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (PIDE) SPEED LIMIT	0.	-	0.	-	51.6	10.3
(4) SOIL/SLOPE RESISTANCES	72.8	24.9	74.3	20.2	36.5	11.3
(5) VISIBILITY LIMIT	0.	-	0.	-	0.8	27.9
(6) ROAD CURVATURE	12.7	16.2	15.5	15.1	9.6	7.1
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	10.2	12.1	0.	-
West Germany - Snow Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	1.3	N0-60	1.5	N0-60
(3) ROUGHNESS (PIDE) SPEED LIMIT	0.	-	0.	-	24.4	8.2
(4) SOIL/SLOPE RESISTANCES	84.6	9.0	82.6	8.2	68.7	6.5
(5) VISIBILITY LIMIT	0.	-	1.1	32.6	0.4	24.1
(6) ROAD CURVATURE	1.0	10.5	4.8	9.2	5.0	5.9
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	10.2	9.4	0.	-
Mid-East - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (PIDE) SPEED LIMIT	0.	-	0.	-	47.3	10.4
(4) SOIL/SLOPE RESISTANCES	81.7	26.5	71.3	26.0	44.8	11.3
(5) VISIBILITY LIMIT	0.	-	0.	-	2.5	28.4
(6) ROAD CURVATURE	18.3	13.5	9.7	19.7	5.4	9.9
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	12.6	0.	-
Mid-East - Sand Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	98.7	N0-60
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.9	N0-60
(3) ROUGHNESS (PIDE) SPEED LIMIT	0.	-	0.	-	0.1	13.3
(4) SOIL/SLOPE RESISTANCES	81.7	26.5	46.6	22.9	0.3	7.6
(5) VISIBILITY LIMIT	0.	-	0.	-	0.	-
(6) ROAD CURVATURE	18.3	12.9	34.4	24.2	0.	-
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	9.7	0.	-

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Table E66
Diagnostics Statistics for M548E1-XM204

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails	
	Area Limited %	Average Speed mph	Wet Condition	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	
West Germany - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	0.	-	
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.	-	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	29.9	30.3	73.8	12.7	
(4) SOIL/SLOPE RESISTANCES	68.2	36.9	-	40.6	25.3	15.5	9.3	
(5) VISIBILITY LIMIT	0.	-	-	0.	-	0.1	16.0	
(6) ROAD CURVATURE	17.4	18.3	-	19.3	15.9	10.5	7.2	
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	-	10.2	12.1	0.	-	
West Germany - Snow Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	0.	-	
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.	-	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	30.5	30.3	83.6	12.9	
(4) SOIL/SLOPE RESISTANCES	67.6	38.3	-	35.2	29.7	4.9	13.2	
(5) VISIBILITY LIMIT	0.	-	-	0.4	37.7	0.	-	
(6) ROAD CURVATURE	18.0	17.6	-	23.7	13.4	11.5	7.4	
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	-	10.2	9.4	0.	-	
Mid-East - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	0.	-	
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.1	NO-00	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	39.4	30.3	80.1	13.6	
(4) SOIL/SLOPE RESISTANCES	73.4	39.6	-	27.0	37.3	13.9	7.2	
(5) VISIBILITY LIMIT	0.	-	-	0.	-	0.6	18.7	
(6) ROAD CURVATURE	26.6	16.6	-	14.6	21.4	5.4	9.3	
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	12.6	0.	-	
Mid-East - Sand Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	0.	-	
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.	-	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	35.8	30.3	58.1	12.8	
(4) SOIL/SLOPE RESISTANCES	73.4	39.6	-	23.6	36.6	37.9	6.3	
(5) VISIBILITY LIMIT	0.	-	-	0.	-	0.	-	
(6) ROAD CURVATURE	26.6	15.8	-	21.6	18.9	4.0	8.5	
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	9.7	0.	-	

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Table E67
Diagnostics Statistics for MS48E1-XM198

Factors Limiting Speed	Primary Roads		Secondary Roads		Trails	
	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph
West Germany - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	28.4	30.3	62.7	12.7
(4) SOIL/SLOPE RESISTANCES	68.7	34.2	43.3	19.3	27.3	8.0
(5) VISIBILITY LIMIT	0.	-	0.	-	0.1	15.3
(6) ROAD CURVATURE	16.8	18.2	18.2	15.9	9.9	7.1
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	10.2	12.1	0.	-
West Germany - Snow Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	28.5	30.3	81.4	12.7
(4) SOIL/SLOPE RESISTANCES	68.2	36.4	38.1	23.8	7.5	10.1
(5) VISIBILITY LIMIT	0.	-	0.4	37.6	0.	-
(6) ROAD CURVATURE	17.4	17.4	22.8	13.3	11.1	7.4
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	10.2	9.4	0.	-
Mid-East - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.1	NO-GO
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	38.9	30.3	67.8	13.1
(4) SOIL/SLOPE RESISTANCES	75.9	36.5	27.7	35.3	27.1	8.0
(5) VISIBILITY LIMIT	0.	-	0.	-	0.2	16.7
(6) ROAD CURVATURE	24.1	15.8	14.4	21.4	4.9	9.2
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	12.6	0.	-
Mid-East - Sand Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	1.8	NO-GO
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	35.3	30.3	33.2	12.6
(4) SOIL/SLOPE RESISTANCES	75.9	36.5	24.3	34.4	62.6	5.0
(5) VISIBILITY LIMIT	0.	-	0.	-	0.	-
(6) ROAD CURVATURE	24.1	15.1	21.4	18.9	2.5	7.8
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	9.7	0.	-

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Table E68
Diagnostics Statistics for MS48E1-FH70

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails	
	Area Limited %	Average Speed mph	Wet Condition	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	
	West Germany - Snow Condition			West Germany - Snow Condition				
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	96.2	NO-GO	
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.	-	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	27.3	30.3	2.4	10.9	
(4) SOIL/SLOPE RESISTANCES	68.9	30.3	-	44.9	17.7	1.2	7.7	
(5) VISIBILITY LIMIT	0.	-	-	0.	-	0.	-	
(6) ROAD CURVATURE	16.6	18.2	-	17.6	15.9	0.3	5.5	
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	-	10.2	12.1	0.	-	
West Germany - Snow Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	0.	-	
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.	-	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	28.5	30.3	78.8	12.8	
(4) SOIL/SLOPE RESISTANCES	68.2	35.8	-	38.5	22.0	10.4	9.0	
(5) VISIBILITY LIMIT	0.	-	-	0.5	37.8	0.	-	
(6) ROAD CURVATURE	17.3	17.4	-	22.3	13.3	10.9	7.3	
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	-	10.2	9.4	0.	-	
Mid-East - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	98.7	NO-GO	
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.	-	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	36.2	30.3	0.3	15.2	
(4) SOIL/SLOPE RESISTANCES	76.5	35.5	-	30.4	34.1	0.9	5.4	
(5) VISIBILITY LIMIT	0.	-	-	0.	-	0.	-	
(6) ROAD CURVATURE	23.5	15.6	-	14.4	21.4	0.1	7.1	
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	12.6	0.	-	
Mid-East - Sand Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	0.	-	
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.	-	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	33.0	30.3	8.2	NO-GO	
(4) SOIL/SLOPE RESISTANCES	75.9	35.5	-	26.8	33.3	30.3	11.4	
(5) VISIBILITY LIMIT	0.	-	-	0.	-	59.2	5.4	
(6) ROAD CURVATURE	24.1	15.1	-	21.3	18.8	0.	-	
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	9.7	2.3	7.7	

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Table E69
Diagnostics Statistics for UET-XM198

Factors Limiting Speed	Primary Roads		Secondary Roads		Trails	
	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph
West Germany - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	39.2	15.2
(4) SOIL/SLOPE RESISTANCES	71.3	28.3	70.2	23.6	47.8	13.2
(5) VISIBILITY LIMIT	0.	-	0.	-	0.7	22.4
(6) ROAD CURVATURE	14.3	16.8	19.7	16.4	12.2	7.9
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	10.2	12.1	0.	-
West Germany - Dry Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	56.1	15.8
(4) SOIL/SLOPE RESISTANCES	70.6	31.0	65.7	26.2	28.5	19.5
(5) VISIBILITY LIMIT	0.	-	0.	-	0.4	28.1
(6) ROAD CURVATURE	14.9	16.1	24.1	13.7	15.0	8.7
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	10.2	9.4	0.	-
Mid-East - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.1	NO-GO
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	40.4	16.8
(4) SOIL/SLOPE RESISTANCES	81.8	31.0	63.1	30.8	50.6	13.6
(5) VISIBILITY LIMIT	0.	-	0.	-	1.3	23.8
(6) ROAD CURVATURE	18.2	13.4	17.9	22.7	7.7	11.8
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	12.6	0.	-
Mid-East - Sand Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	21.3	15.2
(4) SOIL/SLOPE RESISTANCES	81.8	31.0	55.8	30.6	74.1	8.8
(5) VISIBILITY LIMIT	0.	-	0.	-	0.	-
(6) ROAD CURVATURE	18.2	12.8	25.2	20.1	4.6	9.7
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	9.7	0.	-

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Table E70
Diagnostics Statistics for UET-FH70

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails	
	Area Limited %	Average Speed mph	Wet Condition	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	
West Germany - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	96.2	NO-80	
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.	-	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	0.	-	2.3	16.2	
(4) SOIL/SLOPE RESISTANCES	71.3	27.8	-	70.4	23.0	1.2	10.5	
(5) VISIBILITY LIMIT	0.	-	-	0.	-	0.	-	
(6) ROAD CURVATURE	14.2	16.8	-	19.4	16.3	0.3	6.0	
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	-	10.2	12.1	0.	-	
West Germany - Snow Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	0.	-	
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.	-	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	0.	-	53.9	15.7	
(4) SOIL/SLOPE RESISTANCES	71.0	29.5	-	65.9	25.5	30.8	18.4	
(5) VISIBILITY LIMIT	0.	-	-	0.	-	0.4	28.1	
(6) ROAD CURVATURE	14.5	16.1	-	23.9	13.7	15.0	8.7	
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	-	10.2	9.4	0.	-	
Mid-East - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	98.7	NO-80	
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.3	22.2	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	0.	-	0.9	8.2	
(4) SOIL/SLOPE RESISTANCES	81.8	30.8	-	63.4	30.5	0.	-	
(5) VISIBILITY LIMIT	0.	-	-	0.	-	0.	-	
(6) ROAD CURVATURE	18.2	13.4	-	17.6	22.6	0.1	9.6	
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	12.6	0.	-	
Mid-East - Sand Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	0.	-	
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.	-	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	0.	-	21.3	15.2	
(4) SOIL/SLOPE RESISTANCES	81.8	30.8	-	56.3	30.3	74.1	7.4	
(5) VISIBILITY LIMIT	0.	-	-	0.	-	0.	-	
(6) ROAD CURVATURE	18.2	12.8	-	24.7	20.0	4.6	9.8	
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	9.7	0.	-	

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Table E71
Diagnostics Statistics for ASV-XM204

Factors Limiting Speed	Primary Roads		Secondary Roads		Trails	
	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph
West Germany - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	35.9	21.6
(4) SOIL/SLOPE RESISTANCES	68.4	38.3	67.1	29.3	40.4	14.8
(5) VISIBILITY LIMIT	0.	-	0.	-	7.5	31.5
(6) ROAD CURVATURE	17.2	18.2	22.7	17.6	16.2	9.1
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	10.2	12.1	0.	-
West Germany - Snow Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	49.5	22.5
(4) SOIL/SLOPE RESISTANCES	68.0	40.4	11.9	17.4	27.4	23.6
(5) VISIBILITY LIMIT	0.	-	0.7	37.6	3.1	37.2
(6) ROAD CURVATURE	17.6	17.5	77.3	24.6	19.9	10.0
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	10.2	9.4	0.	-
Mid-East - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	8.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.1	NO-GO
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	37.0	22.4
(4) SOIL/SLOPE RESISTANCES	75.5	40.5	56.2	41.2	40.0	14.7
(5) VISIBILITY LIMIT	0.	-	0.	-	9.6	30.4
(6) ROAD CURVATURE	24.5	15.9	24.8	25.8	13.3	13.7
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	12.6	0.	-
Mid-East - Sand Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	14.9	23.5
(4) SOIL/SLOPE RESISTANCES	75.5	40.5	5.1	27.1	76.1	9.3
(5) VISIBILITY LIMIT	0.	-	0.	-	0.	-
(6) ROAD CURVATURE	24.5	15.1	75.8	29.7	9.0	12.8
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	9.7	0.	-

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Table E72
Diagnostics Statistics for ASV-XM198

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails		
	Limited %	Average Speed mph	Wet Condition	Limited %	Average Speed mph	Wet Condition	Limited %	Average Speed mph	Wet Condition
West Germany - Snow Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	-	0.	-	-
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	-	0.	-	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	0.	-	-	34.6	21.6	-
(4) SOIL/SLOPE RESISTANCES	68.8	36.1	-	68.1	25.9	-	44.5	11.8	-
(5) VISIBILITY LIMIT	0.	-	-	0.	-	-	5.3	33.5	-
(6) ROAD CURVATURE	16.7	18.2	-	21.7	17.5	-	15.5	9.8	-
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	-	10.2	12.1	-	0.	-	-
West Germany - Snow Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	-	0.	-	-
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	-	0.	-	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	0.	-	-	48.4	22.5	-
(4) SOIL/SLOPE RESISTANCES	68.2	38.9	-	14.5	15.7	-	29.2	20.2	-
(5) VISIBILITY LIMIT	0.	-	-	0.7	37.5	-	3.1	37.2	-
(6) ROAD CURVATURE	17.4	17.4	-	74.6	24.5	-	19.3	10.8	-
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	-	10.2	9.4	-	0.	-	-
Mid-East - Wet Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	-	0.	-	-
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	-	0.1	NO-GO	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	0.	-	-	33.0	22.5	-
(4) SOIL/SLOPE RESISTANCES	76.5	38.5	-	57.9	39.2	-	49.6	13.2	-
(5) VISIBILITY LIMIT	0.	-	-	0.	-	-	5.6	38.7	-
(6) ROAD CURVATURE	23.5	15.6	-	23.1	25.3	-	11.8	13.2	-
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	12.6	-	0.	-	-
Mid-East - Sand Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	-	0.	-	-
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	-	0.	-	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	0.	-	-	14.9	23.5	-
(4) SOIL/SLOPE RESISTANCES	75.9	38.6	-	5.8	22.9	-	77.9	7.5	-
(5) VISIBILITY LIMIT	0.	-	-	0.	-	-	0.	-	-
(6) ROAD CURVATURE	24.1	15.1	-	75.2	29.8	-	7.1	12.6	-
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	9.7	-	0.	-	-

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Table E73
Diagnostics Statistics for ASV-FH70

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails	
	Area Limited %	Average Speed mph		Area Limited %	Average Speed mph		Area Limited %	Average Speed mph
West Germany - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		96.2	NO-GO
(2) INSUFFICIENT TRACTION	0.	-		0.	-		0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		0.	-		1.3	22.3
(4) SOIL/SLOPE RESISTANCES	68.8	35.4		68.3	24.8		2.1	11.8
(5) VISIBILITY LIMIT	0.	-		0.	-		0.	-
(6) ROAD CURVATURE	16.7	18.2		21.5	17.5		0.4	7.4
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7		10.2	12.1		0.	-
West Germany - Snow Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		0.	-
(2) INSUFFICIENT TRACTION	0.	-		0.	-		0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		0.	-		48.4	22.5
(4) SOIL/SLOPE RESISTANCES	68.2	38.3		14.7	14.8		29.3	19.3
(5) VISIBILITY LIMIT	0.	-		0.7	37.5		3.1	37.2
(6) ROAD CURVATURE	17.3	17.4		74.4	24.5		19.2	9.9
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0		10.2	9.4		0.	-
Mid-East - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		98.7	NO-GO
(2) INSUFFICIENT TRACTION	0.	-		0.	-		0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		0.	-		0.2	32.1
(4) SOIL/SLOPE RESISTANCES	76.5	37.8		57.9	38.3		0.9	7.8
(5) VISIBILITY LIMIT	0.	-		0.	-		0.	-
(6) ROAD CURVATURE	23.5	15.6		23.1	25.3		0.2	11.9
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-		19.0	12.6		0.	-
Mid-East - Sand Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		0.	-
(2) INSUFFICIENT TRACTION	0.	-		0.	-		0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		0.	-		14.9	23.5
(4) SOIL/SLOPE RESISTANCES	76.5	37.8		17.4	30.4		78.0	6.9
(5) VISIBILITY LIMIT	0.	-		0.	-		0.	-
(6) ROAD CURVATURE	23.5	14.9		63.5	28.5		7.1	12.5
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-		19.0	9.7		0.	-

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Table E74
Diagnostics Statistics for M109A1

Factors Limiting Speed	Primary Roads		Secondary Roads		Trails	
	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph
West Germany - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	0.	-
(4) SOIL/SLOPE RESISTANCES	71.2	29.1	70.3	24.7	44.8	16.0
(5) VISIBILITY LIMIT	0.	-	0.	-	40.5	14.3
(6) ROAD CURVATURE	14.4	16.8	19.5	16.3	0.9	21.8
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	10.2	12.1	13.9	8.3
					0.	-
West Germany - Snow Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	0.	-
(4) SOIL/SLOPE RESISTANCES	70.7	30.2	68.2	27.2	56.7	16.0
(5) VISIBILITY LIMIT	0.	-	0.	-	27.8	21.5
(6) ROAD CURVATURE	14.8	16.1	21.6	12.8	0.3	27.1
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	10.2	9.4	16.1	8.8
					0.	-
Mid-East - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.1	NO-RO
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	50.0	16.3
(4) SOIL/SLOPE RESISTANCES	81.4	31.0	63.1	30.8	39.5	14.5
(5) VISIBILITY LIMIT	0.	-	0.	-	1.9	23.1
(6) ROAD CURVATURE	18.6	13.5	17.9	22.7	8.6	11.6
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	12.6	0.	-
Mid-East - Sand Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	26.1	16.1
(4) SOIL/SLOPE RESISTANCES	81.4	31.0	62.9	30.8	68.1	9.3
(5) VISIBILITY LIMIT	0.	-	0.	-	0.	-
(6) ROAD CURVATURE	18.6	12.9	18.1	17.6	5.8	10.1
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	9.7	0.	-

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Table E75
Diagnostics Statistics for M107

Factors Limiting Speed	Primary Roads		Secondary Roads		Trails	
	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph
West Germany - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	0.	-
(4) SOIL/SLOPE RESISTANCES	71.2	29.0	70.4	24.2	43.2	16.0
(5) VISIBILITY LIMIT	0.	-	0.	-	42.1	14.0
(6) ROAD CURVATURE	14.4	16.8	19.4	16.4	1.0	21.2
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	10.2	12.1	13.7	8.3
					0.	-
West Germany - Snow Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	0.	-
(4) SOIL/SLOPE RESISTANCES	70.8	30.1	68.2	27.0	56.7	16.0
(5) VISIBILITY LIMIT	0.	-	0.	-	27.0	21.2
(6) ROAD CURVATURE	14.8	16.1	21.6	12.8	0.3	27.1
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	10.2	9.4	16.0	8.8
					0.	-
Mid-East - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.1	NO-GO
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	0.4	16.3
(4) SOIL/SLOPE RESISTANCES	81.4	30.9	63.1	30.7	48.4	14.1
(5) VISIBILITY LIMIT	0.	-	0.	-	41.0	22.5
(6) ROAD CURVATURE	18.6	13.5	17.9	22.7	2.0	11.6
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	12.6	8.6	-
					0.	-
Mid-East - Sand Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	0.	-
(4) SOIL/SLOPE RESISTANCES	81.4	30.9	62.9	30.7	26.1	16.1
(5) VISIBILITY LIMIT	0.	-	0.	-	68.1	9.0
(6) ROAD CURVATURE	18.6	12.9	18.1	17.6	0.	-
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	9.7	5.8	10.1
					0.	-

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Table E76
Diagnostics Statistics for M10E2

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails	
	Area Limited %	Average Speed mph	Wet Condition	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	
West Germany - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	0.	-	0.	-	
(2) INSUFFICIENT TRACTION	0.	-	0.	0.	-	0.	-	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	0.	-	43.2	16.0	
(4) SOIL/SLOPE RESISTANCES	71.2	29.0	70.4	24.2	42.1	1.0	14.0	
(5) VISIBILITY LIMIT	0.	-	0.	0.	-	13.7	21.2	
(6) ROAD CURVATURE	14.4	16.8	19.4	16.4	8.3	0.	-	
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	10.2	12.1	-	0.	-	
West Germany - Snow Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	0.	-	0.	-	
(2) INSUFFICIENT TRACTION	0.	-	0.	0.	-	0.	-	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	0.	-	56.7	16.0	
(4) SOIL/SLOPE RESISTANCES	70.8	30.1	68.2	27.0	21.2	27.0	27.1	
(5) VISIBILITY LIMIT	0.	-	0.	0.	-	16.0	8.8	
(6) ROAD CURVATURE	14.8	16.1	21.6	12.8	-	0.	-	
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	10.2	9.4	-	0.	-	
Mid-East - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	0.	-	0.	-	
(2) INSUFFICIENT TRACTION	0.	-	0.	0.	-	0.1	NO-GO	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	0.	-	48.4	14.3	
(4) SOIL/SLOPE RESISTANCES	81.4	30.9	63.1	30.7	14.1	41.0	14.1	
(5) VISIBILITY LIMIT	0.	-	0.	0.	-	2.0	22.5	
(6) ROAD CURVATURE	18.6	13.5	17.9	22.7	11.6	8.6	11.6	
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	12.6	-	0.	-	
Mid-East - Sand Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	0.	-	0.	-	
(2) INSUFFICIENT TRACTION	0.	-	0.	0.	-	0.	-	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	0.	-	26.1	16.1	
(4) SOIL/SLOPE RESISTANCES	81.4	30.9	62.9	30.7	9.0	68.1	9.0	
(5) VISIBILITY LIMIT	0.	-	0.	0.	-	0.	-	
(6) ROAD CURVATURE	18.6	12.9	18.1	17.6	10.1	5.8	10.1	
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	9.7	-	0.	-	

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Table E77
Diagnostics Statistics for M113A1

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails		
	Area Limited %	Average Speed mph	Wet Condition	Area Limited %	Average Speed mph	Wet Condition	Area Limited %	Average Speed mph	Wet Condition
West Germany - Wet Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	-	0.	-	-
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	-	0.	-	-
(3) ROUGHNESS (PIKE) SPEED LIMIT	0.	-	-	0.	-	-	67.5	15.0	-
(4) SOIL/SLOPE RESISTANCES	68.1	38.6	-	65.9	34.0	-	13.8	17.3	-
(5) VISIBILITY LIMIT	0.	-	-	0.	-	-	4.1	24.4	-
(6) ROAD CURVATURE	17.4	18.3	-	24.0	17.7	-	14.6	8.5	-
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	-	10.2	12.1	-	0.	-	-
West Germany - Snow Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	-	0.	-	-
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	-	0.	-	-
(3) ROUGHNESS (PIKE) SPEED LIMIT	0.	-	-	0.	-	-	77.8	16.2	-
(4) SOIL/SLOPE RESISTANCES	67.3	41.3	-	10.2	21.8	-	5.5	16.7	-
(5) VISIBILITY LIMIT	0.	-	-	0.7	37.7	-	0.6	31.4	-
(6) ROAD CURVATURE	18.3	17.7	-	78.9	24.7	-	16.1	9.0	-
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	-	10.2	9.4	-	0.	-	-
Mid-East - Wet Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	-	0.	-	-
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	-	1.4	NO-GO	-
(3) ROUGHNESS (RIE) SPEED LIMIT	0.	-	-	0.	-	-	64.3	15.9	-
(4) SOIL/SLOPE RESISTANCES	73.4	41.8	-	55.4	41.3	-	17.4	15.4	-
(5) VISIBILITY LIMIT	0.	-	-	0.	-	-	6.7	27.4	-
(6) ROAD CURVATURE	26.6	16.6	-	25.6	26.0	-	10.1	12.5	-
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	12.6	-	0.	-	-
Mid-East - Sand Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	-	0.	-	-
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	-	0.	-	-
(3) ROUGHNESS (RIE) SPEED LIMIT	0.	-	-	0.	-	-	47.7	15.1	-
(4) SOIL/SLOPE RESISTANCES	73.4	41.8	-	2.5	30.7	-	44.3	9.7	-
(5) VISIBILITY LIMIT	0.	-	-	0.	-	-	0.	-	-
(6) ROAD CURVATURE	26.6	15.8	-	78.5	30.0	-	8.0	11.5	-
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	9.7	-	0.	-	-

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Table E78
Diagnostics Statistics for M60A2

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails	
	Area Limited %	Average Speed mph	Wet Condition	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	
West Germany - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	0.	-	
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.	-	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	0.	-	39.7	16.5	
(4) SOIL/SLOPE RESISTANCES	72.8	28.7	-	72.2	25.2	44.1	17.5	
(5) VISIBILITY LIMIT	0.	-	-	0.	-	2.1	21.5	
(6) ROAD CURVATURE	12.8	15.8	-	17.7	15.3	14.1	8.4	
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	-	10.2	12.1	0.	-	
West Germany - Snow Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	0.	-	
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.	-	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	0.	-	45.9	16.7	
(4) SOIL/SLOPE RESISTANCES	70.6	29.3	-	67.7	27.2	37.1	24.8	
(5) VISIBILITY LIMIT	0.	-	-	0.	-	0.2	23.3	
(6) ROAD CURVATURE	14.9	16.1	-	22.1	12.9	16.8	9.1	
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	-	10.2	9.4	0.	-	
Mid-East - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	0.	-	
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.1	NO-GO	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	0.	-	36.2	17.3	
(4) SOIL/SLOPE RESISTANCES	85.7	29.6	-	69.4	29.5	50.9	17.1	
(5) VISIBILITY LIMIT	0.	-	-	0.	-	2.8	21.6	
(6) ROAD CURVATURE	14.3	11.6	-	11.6	19.9	10.0	12.0	
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	12.6	0.	-	
Mid-East - Sand Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	0.	-	
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	0.	-	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	0.	-	19.4	16.3	
(4) SOIL/SLOPE RESISTANCES	82.0	29.6	-	62.7	29.5	73.7	11.0	
(5) VISIBILITY LIMIT	0.	-	-	0.	-	0.	-	
(6) ROAD CURVATURE	18.0	12.7	-	18.3	17.6	6.9	10.8	
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	9.7	0.	-	

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Table E79
Diagnostics Statistics for M548E1

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails		
	Area Limited	Average Speed		Area Limited	Average Speed		Area Limited	Average Speed	
	§	mph		§	mph		§	mph	
West Germany - Wet Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		0.	-	
(2) INSUFFICIENT TRACTION	0.	-		0.	-		0.	-	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		30.0	30.3		80.2	12.6	
(4) SOIL/SLOPE RESISTANCES	67.9	38.0		39.2	28.8		8.4	12.0	
(5) VISIBILITY LIMIT	0.	-		0.	-		0.5	15.1	
(6) ROAD CURVATURE	17.6	18.4		19.8	16.0		10.9	7.2	
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7		10.2	12.1		0.	-	
West Germany - Snow Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		0.	-	
(2) INSUFFICIENT TRACTION	0.	-		0.	-		0.	-	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		31.5	30.3		86.3	13.0	
(4) SOIL/SLOPE RESISTANCES	67.3	40.0		33.8	32.3		2.0	10.1	
(5) VISIBILITY LIMIT	0.	-		0.4	37.8		0.	-	
(6) ROAD CURVATURE	18.3	17.7		24.0	13.4		11.7	7.5	
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0		10.2	9.4		0.	-	
Mid-East - Wet Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		0.	-	
(2) INSUFFICIENT TRACTION	0.	-		0.	-		0.1	NO-GO	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		42.1	30.3		82.9	13.5	
(4) SOIL/SLOPE RESISTANCES	73.4	40.0		24.2	40.0		10.4	3.2	
(5) VISIBILITY LIMIT	0.	-		0.	-		1.2	16.4	
(6) ROAD CURVATURE	26.6	16.6		14.7	21.4		5.5	9.4	
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-		19.0	12.6		0.	-	
Mid-East - Sand Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		0.	-	
(2) INSUFFICIENT TRACTION	0.	-		0.	-		0.	-	
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		38.3	30.3		59.6	12.7	
(4) SOIL/SLOPE RESISTANCES	73.4	40.0		20.9	39.3		35.9	7.6	
(5) VISIBILITY LIMIT	0.	-		0.	-		0.	-	
(6) ROAD CURVATURE	26.6	15.8		21.7	18.9		4.5	9.0	
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-		19.0	9.7		0.	-	

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Table E80
Diagnostics Statistics for MS77A1

Factors Limiting Speed	Primary Roads		Secondary Roads		Trails	
	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph
West Germany - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	67.5	15.0
(4) SOIL/SLOPE RESISTANCES	68.2	38.4	66.1	33.5	13.8	16.7
(5) VISIBILITY LIMIT	0.	-	0.	-	4.1	26.6
(6) ROAD CURVATURE	17.4	18.3	23.7	17.6	14.6	8.5
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	10.2	12.1	0.	-
West Germany - Snow Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	76.7	16.1
(4) SOIL/SLOPE RESISTANCES	67.4	41.1	10.3	21.5	6.6	17.9
(5) VISIBILITY LIMIT	0.	-	0.7	37.6	0.6	31.4
(6) ROAD CURVATURE	18.1	17.7	78.0	24.7	16.0	9.0
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	10.2	9.4	0.	-
Mid-East - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.1	NO-GO
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	64.4	15.9
(4) SOIL/SLOPE RESISTANCES	73.4	41.7	55.6	40.4	18.2	5.3
(5) VISIBILITY LIMIT	0.	-	0.	-	7.2	26.6
(6) ROAD CURVATURE	26.6	16.6	25.4	26.0	10.2	12.4
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	12.6	0.	-
Mid-East - Sand Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	47.7	15.1
(4) SOIL/SLOPE RESISTANCES	73.4	41.7	2.7	23.7	44.3	9.2
(5) VISIBILITY LIMIT	0.	-	0.	-	0.	-
(6) ROAD CURVATURE	26.6	15.8	78.3	30.0	8.0	11.5
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	9.7	0.	-

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Table E81
Diagnostics Statistics for XM723

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails	
	Area Limited %	Average Speed mph		Area Limited %	Average Speed mph		Area Limited %	Average Speed mph
West Germany - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		0.	-
(2) INSUFFICIENT TRACTION	0.	-		0.	-		0.5	NO-GO
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		0.	-		43.4	21.7
(4) SOIL/SLOPE RESISTANCES	68.0	41.1		65.7	35.1		27.4	19.1
(5) VISIBILITY LIMIT	0.	-		0.	-		11.4	28.6
(6) ROAD CURVATURE	17.6	18.3		24.1	17.7		17.4	9.4
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7		10.2	12.1		0.	-
West Germany - Snow Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		0.	-
(2) INSUFFICIENT TRACTION	0.	-		0.	-		0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		0.	-		52.9	22.5
(4) SOIL/SLOPE RESISTANCES	67.4	42.6		9.9	24.0		23.2	31.0
(5) VISIBILITY LIMIT	0.	-		0.7	37.7		3.1	37.4
(6) ROAD CURVATURE	18.1	17.7		79.3	24.7		20.8	10.2
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0		10.2	9.4		0.	-
Mid-East - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		0.	-
(2) INSUFFICIENT TRACTION	0.	-		0.	-		1.8	NO-GO
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		0.	-		42.2	23.3
(4) SOIL/SLOPE RESISTANCES	73.4	43.3		55.4	42.7		29.1	16.4
(5) VISIBILITY LIMIT	0.	-		0.	-		13.0	27.3
(6) ROAD CURVATURE	26.6	16.6		25.6	26.0		14.0	14.1
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-		19.0	12.6		0.	-
Mid-East - Sand Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		0.	-
(2) INSUFFICIENT TRACTION	0.	-		0.	-		0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		0.	-		23.8	22.4
(4) SOIL/SLOPE RESISTANCES	73.4	43.3		2.5	29.5		64.9	12.6
(5) VISIBILITY LIMIT	0.	-		0.	-		0.	-
(6) ROAD CURVATURE	26.6	15.8		78.5	30.0		11.3	13.4
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-		19.0	9.7		0.	-

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Table E82

Diagnostics Statistics for XM1

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails	
	Area Limited %	Average Speed mph		Area Limited %	Average Speed mph		Area Limited %	Average Speed mph
West Germany - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		0.	-
(2) INSUFFICIENT TRACTION	0.	-		0.	-		0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		0.	-		45.6	18.6
(4) SOIL/SLOPE RESISTANCES	67.3	47.9		63.9	44.3		22.2	32.9
(5) VISIBILITY LIMIT	0.	-		0.1	47.5		12.7	36.4
(6) ROAD CURVATURE	18.3	18.6		25.8	18.0		19.6	9.8
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7		10.2	12.1		0.	-
West Germany - Snow Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		0.	-
(2) INSUFFICIENT TRACTION	0.	-		0.	-		0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		0.	-		45.9	18.7
(4) SOIL/SLOPE RESISTANCES	55.4	48.0		2.9	27.9		21.4	42.1
(5) VISIBILITY LIMIT	9.2	45.4		0.7	37.4		11.4	42.5
(6) ROAD CURVATURE	20.9	19.2		86.2	25.4		21.3	10.4
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0		10.2	9.4		0.	-
Mid-East - Wet Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		0.	-
(2) INSUFFICIENT TRACTION	0.	-		0.	-		0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		0.	-		39.6	19.5
(4) SOIL/SLOPE RESISTANCES	73.4	48.0		54.8	48.0		26.5	29.2
(5) VISIBILITY LIMIT	0.	-		0.	-		16.9	35.2
(6) ROAD CURVATURE	26.6	16.6		26.2	26.2		17.0	14.9
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-		19.0	12.6		0.	-
Mid-East - Sand Condition								
(1) INSUFFICIENT SOIL STRENGTH	0.	-		0.	-		0.	-
(2) INSUFFICIENT TRACTION	0.	-		0.	-		0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-		0.	-		33.0	19.1
(4) SOIL/SLOPE RESISTANCES	70.0	48.0		0.	-		49.5	20.3
(5) VISIBILITY LIMIT	0.	-		0.	-		0.1	40.8
(6) ROAD CURVATURE	30.0	17.1		81.0	30.1		17.4	15.7
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-		19.0	9.7		0.	-

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Table E83
Diagnostics Statistics for ASV

Factors Limiting Speed	Primary Roads		Secondary Roads		Trails	
	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph
West Germany - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	0.	-
(4) SOIL/SLOPE RESISTANCES	68.2	39.2	66.7	30.9	39.2	22.1
(5) VISIBILITY LIMIT	0.	-	0.	-	33.3	14.8
(6) ROAD CURVATURE	17.3	18.3	0.	-	10.9	29.3
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	23.1	17.6	16.6	9.2
			10.2	12.1	0.	-
West Germany - Snow Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	0.	-
(4) SOIL/SLOPE RESISTANCES	67.7	41.1	11.6	19.4	50.5	22.4
(5) VISIBILITY LIMIT	0.	-	0.7	37.6	26.0	26.1
(6) ROAD CURVATURE	17.9	17.6	77.5	24.6	3.1	37.3
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	10.2	9.4	20.3	10.1
					0.	-
Mid-East - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.1	NO-RO
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	40.7	23.4
(4) SOIL/SLOPE RESISTANCES	75.5	41.5	56.1	41.8	34.0	12.2
(5) VISIBILITY LIMIT	0.	-	0.	-	12.0	28.4
(6) ROAD CURVATURE	24.5	15.9	24.9	25.8	13.3	13.8
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	12.6	0.	-
Mid-East - Sand Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	0.	-
(4) SOIL/SLOPE RESISTANCES	75.5	41.5	3.1	25.3	19.7	21.5
(5) VISIBILITY LIMIT	0.	-	0.	-	71.1	10.1
(6) ROAD CURVATURE	24.5	15.1	77.9	29.9	0.	-
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	13.0	9.7	9.2	13.0
					0.	-

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Table E84

Diagnostics Statistics for M561

Factors Limiting Speed	Primary Roads		Secondary Roads		Trails	
	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph
West Germany - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	27.5	32.3	87.8	9.2
(4) SOIL/SLOPE RESISTANCES	65.0	50.8	15.0	25.8	2.2	17.8
(5) VISIBILITY LIMIT	0.	-	0.5	48.9	0.1	16.9
(6) ROAD CURVATURE	20.6	20.0	46.9	25.7	9.9	7.9
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	10.2	12.1	0.	-
West Germany - Snow Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	10.5	32.3	82.7	8.9
(4) SOIL/SLOPE RESISTANCES	61.2	28.8	49.8	25.8	7.8	15.8
(5) VISIBILITY LIMIT	9.2	45.6	0.4	37.8	0.	-
(6) ROAD CURVATURE	15.1	16.3	29.1	15.5	9.5	7.7
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	10.2	9.4	0.	-
Mid-East - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	35.8	32.3	89.4	10.6
(4) SOIL/SLOPE RESISTANCES	70.3	52.6	2.5	31.5	4.4	16.0
(5) VISIBILITY LIMIT	0.	-	0.	-	0.7	20.5
(6) ROAD CURVATURE	29.7	17.8	42.7	32.7	5.5	10.1
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	12.6	0.	-
Mid-East - Sand Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	31.8	32.3	28.3	NO-60
(4) SOIL/SLOPE RESISTANCES	70.3	52.6	2.5	31.5	14.9	9.5
(5) VISIBILITY LIMIT	0.	-	0.	-	0.2	10.2
(6) ROAD CURVATURE	29.7	17.0	46.7	25.8	3.8	23.1
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	9.7	0.	9.7

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Table E85
Diagnostics Statistics for M813

Factors Limiting Speed	Primary Roads		Secondary Roads		Trails	
	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph	Area Limited %	Average Speed mph
	West Germany - Wet Condition					
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	1.5	NO-60
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	22.2	44.4	74.1	9.7
(4) SOIL/SLOPE RESISTANCES	65.8	42.9	43.9	29.1	12.8	13.2
(5) VISIBILITY LIMIT	0.	-	0.4	48.7	0.2	24.8
(6) ROAD CURVATURE	19.7	19.8	23.3	17.6	11.4	8.7
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	10.2	12.1	0.	-
West Germany - Snow Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	0.	-
(4) SOIL/SLOPE RESISTANCES	83.1	11.9	80.7	11.3	33.4	6.3
(5) VISIBILITY LIMIT	0.	-	0.8	37.6	60.2	9.5
(6) ROAD CURVATURE	2.5	9.8	0.3	10.4	0.1	17.7
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	10.2	9.4	6.3	6.7
Mid-East - Wet Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	0.	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	23.9	44.4	78.2	11.4
(4) SOIL/SLOPE RESISTANCES	73.5	42.9	32.3	42.2	12.5	12.8
(5) VISIBILITY LIMIT	0.	-	0.	-	1.0	27.4
(6) ROAD CURVATURE	26.5	16.8	24.9	25.8	8.2	12.6
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	19.0	12.6	0.	-
Mid-East - Sand Condition						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION	0.	-	0.	-	32.5	NO-60
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	0.	-	32.0	8.3
(4) SOIL/SLOPE RESISTANCES	73.5	42.9	5.0	29.2	32.2	8.6
(5) VISIBILITY LIMIT	0.	-	0.	-	0.3	21.1
(6) ROAD CURVATURE	26.5	16.0	76.0	29.7	2.9	9.5
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	12.0	9.7	0.	-

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Table E86

Diagnostics Statistics for UET

Factors Limiting Speed	Primary Roads			Secondary Roads			Trails		
	Area Limited %	Average Speed mph	Wet Condition	Area Limited %	Average Speed mph	Wet Condition	Area Limited %	Average Speed mph	Wet Condition
West Germany - Wet Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	-	0.	-	-
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	-	0.	-	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	0.	-	-	52.4	15.7	-
(4) SOIL/SLOPE RESISTANCES	70.6	31.3	-	69.0	27.0	-	31.8	15.6	-
(5) VISIBILITY LIMIT	0.	-	-	0.	-	-	1.9	20.3	-
(6) ROAD CURVATURE	14.9	16.9	-	20.8	16.5	-	13.8	8.4	-
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.7	-	10.2	12.1	-	0.	-	-
West Germany - Snow Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	-	0.	-	-
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	-	0.	-	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	0.	-	-	59.9	15.8	-
(4) SOIL/SLOPE RESISTANCES	70.1	32.3	-	64.4	29.8	-	23.9	26.5	-
(5) VISIBILITY LIMIT	0.	-	-	0.	-	-	0.4	28.2	-
(6) ROAD CURVATURE	15.4	16.3	-	25.4	13.9	-	15.8	8.9	-
(7) EXTERNAL (URBAN) SPEED LIMIT	14.5	13.0	-	10.2	9.4	-	0.	-	-
Mid-East - Wet Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	-	0.	-	-
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	-	0.1	MO-60	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	0.	-	-	53.5	16.8	-
(4) SOIL/SLOPE RESISTANCES	80.7	32.5	-	62.9	31.9	-	33.0	11.2	-
(5) VISIBILITY LIMIT	0.	-	-	0.	-	-	3.1	21.1	-
(6) ROAD CURVATURE	19.3	13.8	-	18.1	22.7	-	18.3	12.5	-
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	12.6	-	0.	-	-
Mid-East - Sand Condition									
(1) INSUFFICIENT SOIL STRENGTH	0.	-	-	0.	-	-	0.	-	-
(2) INSUFFICIENT TRACTION	0.	-	-	0.	-	-	0.	-	-
(3) ROUGHNESS (RIDE) SPEED LIMIT	0.	-	-	0.	-	-	37.7	16.0	-
(4) SOIL/SLOPE RESISTANCES	80.7	32.5	-	55.4	31.9	-	55.1	10.8	-
(5) VISIBILITY LIMIT	0.	-	-	0.	-	-	0.	-	-
(6) ROAD CURVATURE	19.3	13.2	-	25.6	20.1	-	7.1	10.9	-
(7) EXTERNAL (URBAN) SPEED LIMIT	0.	-	-	19.0	9.7	-	0.	-	-

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Table E87
Diagnostic Statistics for Study Vehicles

Factors Limiting Speed	West Germany				Mid-East			
	Net Condition		Snow Condition		Net Condition		Sand Condition	
	% Area Limited	Average Speed, mph	% Area Limited	Average Speed, mph	% Area Limited	Average Speed, mph	% Area Limited	Average Speed, mph
MS61-M102								
(1) INSUFFICIENT SOIL STRENGTH	0.0	NO-GO	0.0	-	0.0	-	43.7	NO-GO
(2) OBSTACLE INTERFERENCE FOR SLOPES	9.2	NO-GO	9.2	NO-GO	16.3	NO-GO	12.9	NO-GO
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	0.0	NO-GO	0.0	-	0.0	NO-GO	9.1	NO-GO
(4) COMBINATION OF TERRAIN FACTORS	9.6	15.4	12.0	15.9	22.7	18.9	11.7	12.8
(5) ROUGHNESS (RIDE) SPEED LIMIT	9.6	11.4	10.5	9.4	3.5	7.7	6.8	9.2
(6) SOIL/SLOPE RESISTANCES	14.3	11.5	7.2	12.5	23.3	11.6	0.2	9.9
(7) VISIBILITY LIMIT	23.9	10.7	23.2	10.3	16.1	11.0	4.6	11.3
(8) MANEUVER PROBLEMS	2.0	6.2	4.1	10.0	2.4	6.9	2.2	5.9
(9) VEGETATION RESISTANCES	24.2	8.5	24.2	8.6	11.8	6.5	5.4	7.4
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	9.5	14.7	9.5	14.7	3.4	14.9	3.4	14.9
(11) EXTERNAL (URBAN) SPEED LIMIT								
MS61-M204								
(1) INSUFFICIENT SOIL STRENGTH	0.0	NO-GO	0.0	-	0.0	-	68.1	NO-GO
(2) OBSTACLE INTERFERENCE FOR SLOPES	2.6	NO-GO	1.9	NO-GO	0.0	NO-GO	3.7	NO-GO
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	9.2	NO-GO	9.2	NO-GO	16.3	NO-GO	7.5	NO-GO
(4) COMBINATION OF TERRAIN FACTORS	0.1	NO-GO	2.8	NO-GO	0.0	NO-GO	0.0	-
(5) ROUGHNESS (RIDE) SPEED LIMIT	8.3	15.4	8.2	14.9	20.2	11.3	5.8	13.5
(6) SOIL/SLOPE RESISTANCES	3.9	11.9	11.9	8.5	3.7	7.2	9.5	9.5
(7) VISIBILITY LIMIT	15.0	11.3	7.2	11.8	24.4	11.0	0.2	9.6
(8) MANEUVER PROBLEMS	23.2	8.0	10.4	9.9	15.9	11.0	1.0	10.7
(9) VEGETATION RESISTANCES	2.4	6.5	11.3	8.0	3.0	7.1	0.1	8.4
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	23.2	8.5	20.4	8.7	11.6	6.8	4.5	7.4
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	14.7	3.4	14.9	3.4	14.9
MS61-M198								
(1) INSUFFICIENT SOIL STRENGTH	0.0	NO-GO	0.0	-	0.0	-	96.6	NO-GO
(2) OBSTACLE INTERFERENCE FOR SLOPES	14.1	NO-GO	54.8	NO-GO	9.0	NO-GO	0.0	-
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	9.8	NO-GO	9.2	NO-GO	16.3	NO-GO	0.0	-
(4) COMBINATION OF TERRAIN FACTORS	2.4	NO-GO	2.3	NO-GO	0.0	NO-GO	0.0	-
(5) ROUGHNESS (RIDE) SPEED LIMIT	2.8	14.2	8.7	13.7	7.8	9.9	0.0	-
(6) SOIL/SLOPE RESISTANCES	13.8	6.9	4.1	8.1	13.5	8.9	0.0	-
(7) VISIBILITY LIMIT	11.6	10.2	1.9	12.2	14.0	10.2	0.0	-
(8) MANEUVER PROBLEMS	19.4	0.0	9.0	1.2	22.0	0.0	0.0	-
(9) VEGETATION RESISTANCES	5.8	5.2	4.0	3.2	4.3	0.0	0.0	-
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	11.5	7.9	4.4	8.0	8.1	6.2	0.0	-
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	14.7	3.4	14.9	3.4	14.9
MS62-M102								
(1) INSUFFICIENT SOIL STRENGTH	0.0	NO-GO	0.0	-	0.0	-	41.3	NO-GO
(2) OBSTACLE INTERFERENCE FOR SLOPES	0.3	NO-GO	4.2	NO-GO	0.0	NO-GO	25.9	NO-GO
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	0.3	NO-GO	8.3	NO-GO	13.9	NO-GO	9.9	NO-GO
(4) COMBINATION OF TERRAIN FACTORS	0.0	NO-GO	3.8	NO-GO	0.0	NO-GO	4.0	NO-GO
(5) ROUGHNESS (RIDE) SPEED LIMIT	9.4	14.9	3.5	12.9	30.8	11.2	5.2	12.9
(6) SOIL/SLOPE RESISTANCES	7.6	11.1	30.0	0.0	3.1	6.6	4.7	11.4
(7) VISIBILITY LIMIT	13.6	12.5	3.3	10.4	20.5	12.3	0.4	9.7
(8) MANEUVER PROBLEMS	23.5	10.4	14.4	7.7	16.6	10.4	3.4	10.2
(9) VEGETATION RESISTANCES	3.4	11.1	10.1	6.4	1.7	13.7	1.0	3.3
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	24.5	7.6	13.7	7.0	10.0	3.4	0.6	3.4
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	14.7	3.4	14.9	3.4	14.9

(Continued)

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Table E87 (Continued)

Factors Limiting Speed	West Germany			Mid-East		
	Wet Condition		Snow Condition	Wet Condition		Sand Condition
	% Area Limited	Average Speed, mph	% Area Limited	% Area Limited	Average Speed, mph	% Area Limited
M35A2-XM204						
(1) INSUFFICIENT SOIL STRENGTH	0.3	MO-GO	0.9	0.4	MO-GO	MO-GO
(2) INSUFFICIENT TRACTION FOR SLOPES	8.3	MO-GO	8.3	13.9	MO-GO	MO-GO
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	0.4	MO-GO	0.8	0.4	MO-GO	MO-GO
(4) COMBINATION OF TERRAIN FACTORS	9.0	14.8	26.2	27.1	10.7	3.7
(5) ROUGHNESS (RIDE) SPEED LIMIT	8.7	10.6	28.2	5.5	12.2	12.8
(6) SOIL/SLOPE RESISTANCES	13.6	12.2	3.2	21.4	10.3	5.5
(7) VISIBILITY LIMIT	23.3	5.4	14.8	7.3	14.0	9.4
(8) MANEUVER PROBLEMS	3.7	10.0	13.0	2.3	14.0	9.4
(9) VEGETATION RESISTANCES	23.7	7.9	10.7	9.9	3.5	3.4
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	9.5	14.7	9.5	3.4	14.9	14.9
(11) EXTERNAL (URBAN) SPEED LIMIT						
M35A2-XM198						
(1) INSUFFICIENT SOIL STRENGTH	0.8	MO-GO	0.8	0.4	MO-GO	MO-GO
(2) INSUFFICIENT TRACTION FOR SLOPES	3.5	MO-GO	8.4	1.4	MO-GO	MO-GO
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	8.1	MO-GO	8.3	14.1	MO-GO	MO-GO
(4) COMBINATION OF TERRAIN FACTORS	1.0	MO-GO	2.8	0.6	MO-GO	MO-GO
(5) ROUGHNESS (RIDE) SPEED LIMIT	5.0	13.4	0.8	16.2	9.9	0.4
(6) SOIL/SLOPE RESISTANCES	15.9	6.0	7.7	13.1	1.6	8.8
(7) VISIBILITY LIMIT	13.8	11.1	0.8	18.3	10.6	8.1
(8) MANEUVER PROBLEMS	17.8	6.0	1.9	21.7	8.8	0.2
(9) VEGETATION RESISTANCES	8.9	7.7	6.7	2.7	8.3	0.4
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	17.1	7.0	0.7	8.5	3.6	0.4
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	3.4	14.9	14.9
M813-XM204						
(1) INSUFFICIENT SOIL STRENGTH	0.3	MO-GO	0.9	0.4	MO-GO	MO-GO
(2) INSUFFICIENT TRACTION FOR SLOPES	8.3	MO-GO	8.2	10.9	MO-GO	MO-GO
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	0.4	MO-GO	1.8	0.4	MO-GO	MO-GO
(4) COMBINATION OF TERRAIN FACTORS	12.9	12.3	6.5	35.1	8.4	8.2
(5) ROUGHNESS (RIDE) SPEED LIMIT	13.8	9.0	33.2	4.8	8.2	11.2
(6) SOIL/SLOPE RESISTANCES	11.0	12.3	2.9	14.7	12.3	0.4
(7) VISIBILITY LIMIT	19.8	10.1	12.8	16.7	8.2	7.3
(8) MANEUVER PROBLEMS	4.3	9.2	19.6	1.6	10.9	1.3
(9) VEGETATION RESISTANCES	19.8	5.2	12.5	12.7	2.5	2.5
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	9.5	14.7	9.5	3.4	14.9	14.9
(11) EXTERNAL (URBAN) SPEED LIMIT						
M813-M14A1						
(1) INSUFFICIENT SOIL STRENGTH	0.8	MO-GO	0.8	0.4	MO-GO	MO-GO
(2) INSUFFICIENT TRACTION FOR SLOPES	0.7	MO-GO	13.4	0.4	MO-GO	MO-GO
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	8.1	MO-GO	8.2	10.9	MO-GO	MO-GO
(4) COMBINATION OF TERRAIN FACTORS	0.4	MO-GO	2.5	0.4	MO-GO	MO-GO
(5) ROUGHNESS (RIDE) SPEED LIMIT	10.6	11.9	1.9	32.2	8.2	8.8
(6) SOIL/SLOPE RESISTANCES	13.6	7.3	31.6	8.8	0.2	2.7
(7) VISIBILITY LIMIT	11.4	11.9	2.4	13.5	11.5	0.7
(8) MANEUVER PROBLEMS	19.5	9.6	5.6	16.7	7.9	0.4
(9) VEGETATION RESISTANCES	6.3	8.0	17.7	2.6	7.9	0.4
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	18.9	5.6	7.2	12.7	2.3	0.4
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	3.4	14.9	14.9

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Table E87 (Continued)

	Factors Limiting Speed	West Germany			Mid-East		
		Net Condition		Average Speed, mph	Net Condition		Average Speed, mph
		% Area Limited	% Area Limited		% Area Limited	% Area Limited	
M813-JM198							
(1)	INSUFFICIENT SOIL STRENGTH	0.6	NO-GO	9.1	0.1	95.9	NO-GO
(2)	INSUFFICIENT TRACTION FOR SLOPES	0.9	NO-GO	15.1	0.1	0.1	NO-GO
(3)	OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	0.1	NO-GO	9.5	13.6	0.5	NO-GO
(4)	COMBINATION OF TERRAIN FACTORS	0.4	NO-GO	2.8	0.2	0.1	NO-GO
(5)	ROUGHNESS (RIDE) SPEED LIMIT	0.7	11.8	1.4	27.2	0.1	0.1
(6)	SOIL/SLOPE RESISTANCES	13.1	6.1	40.9	5.6	8.3	5.9
(7)	VISIBILITY LIMIT	10.4	11.5	2.1	9.1	11.2	0.1
(8)	MANEUVER PROBLEMS	17.9	8.4	7.2	0.1	7.0	0.2
(9)	VEGETATION RESISTANCES	12.3	8.0	5.9	4.3	5.7	0.1
(10)	OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	17.7	5.1	6.6	10.0	2.4	0.1
(11)	EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	3.4	14.9	14.9
M813-FH70							
(1)	INSUFFICIENT SOIL STRENGTH	78.1	NO-GO	8.1	82.6	96.6	NO-GO
(2)	INSUFFICIENT TRACTION FOR SLOPES	3.3	NO-GO	32.8	2.3	0.1	NO-GO
(3)	OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	1.3	NO-GO	6.2	0.4	0.1	NO-GO
(4)	COMBINATION OF TERRAIN FACTORS	0.1	NO-GO	2.6	0.1	0.1	NO-GO
(5)	ROUGHNESS (RIDE) SPEED LIMIT	0.5	18.3	0.6	9.2	0.1	0.1
(6)	SOIL/SLOPE RESISTANCES	3.8	3.1	31.2	9.9	0.1	0.1
(7)	VISIBILITY LIMIT	0.6	7.9	0.3	4.8	0.1	0.1
(8)	MANEUVER PROBLEMS	1.2	4.0	5.6	8.3	0.1	0.1
(9)	VEGETATION RESISTANCES	0.4	7.2	6.2	0.1	3.5	0.1
(10)	OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	1.2	2.8	3.1	0.7	2.2	0.1
(11)	EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	3.4	14.9	14.9
M813-JM(130 mm)							
(1)	INSUFFICIENT SOIL STRENGTH	0.8	NO-GO	8.1	0.1	96.3	NO-GO
(2)	INSUFFICIENT TRACTION FOR SLOPES	0.9	NO-GO	15.9	0.1	0.1	NO-GO
(3)	OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	0.1	NO-GO	6.2	10.9	0.1	NO-GO
(4)	COMBINATION OF TERRAIN FACTORS	0.4	NO-GO	6.8	0.2	0.1	NO-GO
(5)	ROUGHNESS (RIDE) SPEED LIMIT	9.5	11.8	1.2	11.1	7.9	0.1
(6)	SOIL/SLOPE RESISTANCES	18.2	6.2	37.9	10.6	0.1	6.2
(7)	VISIBILITY LIMIT	9.9	11.4	1.7	12.7	11.3	0.1
(8)	MANEUVER PROBLEMS	15.1	8.1	8.2	17.2	9.7	0.2
(9)	VEGETATION RESISTANCES	10.2	6.7	5.8	6.5	7.8	0.1
(10)	OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	17.4	5.3	5.6	12.6	2.3	0.1
(11)	EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	3.4	14.9	14.9
M856-JM204							
(1)	INSUFFICIENT SOIL STRENGTH	0.1	NO-GO	0.1	0.1	0.1	NO-GO
(2)	INSUFFICIENT TRACTION FOR SLOPES	0.1	NO-GO	7.8	12.7	35.2	NO-GO
(3)	OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	0.1	NO-GO	0.1	0.1	13.3	NO-GO
(4)	COMBINATION OF TERRAIN FACTORS	0.1	NO-GO	0.1	0.1	10.9	NO-GO
(5)	ROUGHNESS (RIDE) SPEED LIMIT	0.4	15.1	12.1	22.6	11.5	12.2
(6)	SOIL/SLOPE RESISTANCES	11.0	9.9	15.2	29.5	9.3	9.6
(7)	VISIBILITY LIMIT	15.2	12.2	7.7	13.3	11.9	12.4
(8)	MANEUVER PROBLEMS	19.9	18.6	19.2	11.0	11.0	9.6
(9)	VEGETATION RESISTANCES	7.7	18.2	7.4	10.0	11.1	5.0
(10)	OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	20.5	8.6	20.2	11.1	4.5	5.0
(11)	EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	3.4	14.9	14.9

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Table E87 (Continued)

Factors Limiting Speed	West Germany				N.J.-Last			
	Net Condition		Snow Condition		Wet Condition		Sand Condition	
	% Area Limited	Average Speed, mph	% Area Limited	Average Speed, mph	% Area Limited	Average Speed, mph	% Area Limited	Average Speed, mph
M656-XM198								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-	82.6	MO-GO
(2) INSUFFICIENT TRACTION FOR SLOPES	2.9	MO-GO	4.2	MO-GO	0.8	MO-GO	1.4	MO-GO
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	7.8	MO-GO	7.8	MO-GO	13.3	MO-GO	8.9	MO-GO
(4) COMBINATION OF TERRAIN FACTORS	0.9	MO-GO	1.5	MO-GO	0.9	MO-GO	0.	-
(5) ROUGHNESS (RIDE) SPEED LIMIT	5.6	14.3	20.6	7.4	17.4	11.2	3.6	18.1
(6) SOIL/SLOPE RESISTANCES	12.4	0.	14.3	11.4	8.9	5.1	7.3	8.5
(7) VISIBILITY LIMIT	14.3	11.4	8.0	12.2	22.5	11.0	0.3	8.9
(8) MANEUVER PROBLEMS	18.5	6.4	17.2	6.3	18.9	9.2	0.	-
(9) VEGETATION RESISTANCES	11.6	6.2	10.5	0.	4.6	7.1	0.	-
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	16.6	7.8	15.4	8.6	9.2	4.7	0.1	3.7
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	14.7	3.4	14.9	3.4	14.9
TDW901-XM204								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-	0.	-
(2) INSUFFICIENT TRACTION FOR SLOPES	0.	-	0.	-	0.	-	17.1	MO-GO
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	5.1	MO-GO	4.9	MO-GO	2.2	MO-GO	3.8	MO-GO
(4) COMBINATION OF TERRAIN FACTORS	0.	-	0.	-	0.	MO-GO	6.9	14.8
(5) ROUGHNESS (RIDE) SPEED LIMIT	4.4	15.8	6.9	16.4	12.7	12.9	42.4	5.6
(6) SOIL/SLOPE RESISTANCES	22.6	7.3	22.7	7.7	20.1	8.3	12.1	12.1
(7) VISIBILITY LIMIT	16.2	12.7	9.2	14.8	22.6	12.1	7.9	9.5
(8) MANEUVER PROBLEMS	21.2	10.5	20.4	11.1	15.5	10.7	4.4	5.3
(9) VEGETATION RESISTANCES	10.9	9.7	14.7	11.3	4.9	9.2	3.3	8.7
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	10.2	8.6	11.7	9.1	18.4	6.6	3.4	14.9
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	14.7	3.4	14.9	3.4	14.9
TDW901-M114A1								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-	43.7	MO-GO
(2) INSUFFICIENT TRACTION FOR SLOPES	0.2	MO-GO	5.0	MO-GO	0.	MO-GO	11.4	MO-GO
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	5.1	MO-GO	5.0	MO-GO	2.4	MO-GO	6.1	MO-GO
(4) COMBINATION OF TERRAIN FACTORS	0.	-	0.	-	0.	-	0.4	MO-GO
(5) ROUGHNESS (RIDE) SPEED LIMIT	2.9	15.8	4.9	15.9	11.1	12.6	4.3	14.1
(6) SOIL/SLOPE RESISTANCES	28.4	6.2	24.8	6.1	26.1	7.1	23.7	4.9
(7) VISIBILITY LIMIT	14.4	12.1	10.2	14.3	20.0	11.5	8.3	9.5
(8) MANEUVER PROBLEMS	18.6	9.4	17.2	10.2	13.0	9.6	2.9	9.8
(9) VEGETATION RESISTANCES	11.8	9.4	18.9	10.7	8.7	6.4	2.5	6.8
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	8.9	8.6	10.3	8.7	15.2	6.7	1.3	8.6
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	14.7	3.4	14.9	3.4	14.9
TDW901-XM198								
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	-	0.	-	82.6	MO-GO
(2) INSUFFICIENT TRACTION FOR SLOPES	0.3	MO-GO	5.1	MO-GO	0.	MO-GO	1.4	MO-GO
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	5.0	MO-GO	5.1	MO-GO	2.4	MO-GO	0.2	MO-GO
(4) COMBINATION OF TERRAIN FACTORS	0.7	MO-GO	0.	-	0.	-	0.	-
(5) ROUGHNESS (RIDE) SPEED LIMIT	2.6	16.2	4.5	15.8	9.7	12.7	2.1	12.1
(6) SOIL/SLOPE RESISTANCES	27.5	5.8	22.3	5.5	26.0	6.7	9.8	6.7
(7) VISIBILITY LIMIT	13.8	11.8	10.4	14.0	18.7	11.3	0.2	18.8
(8) MANEUVER PROBLEMS	15.6	8.4	16.5	8.5	17.4	8.4	0.2	18.9
(9) VEGETATION RESISTANCES	16.8	7.8	21.7	9.2	8.0	4.9	0.	-
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	8.2	8.5	10.0	8.6	14.4	6.4	0.1	7.6
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	14.7	3.4	14.9	3.4	14.9

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Table E87 (Continued)

Factors Limiting Speed	West Germany				Mid-East			
	Wet Condition		Snow Condition		Wet Condition		Snow Condition	
	% Area Limited	Average Speed, mph	% Area Limited	Average Speed, mph	% Area Limited	Average Speed, mph	% Area Limited	Average Speed, mph
TM901-FH70								
(1) INSUFFICIENT SOIL STRENGTH	77.9	NO-GO	0.	-	62.3	NO-GO	95.9	NO-GO
(2) INSUFFICIENT TRACTION FOR SLOPES	2.4	NO-GO	0.	-	1.2	NO-GO	0.5	NO-GO
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	0.8	NO-GO	5.8	NO-GO	0.2	NO-GO	0.	-
(4) COMBINATION OF TERRAIN FACTORS	0.	NO-GO	0.	-	0.	-	0.	-
(5) ROUGHNESS (RIDE) SPEED LIMIT	0.3	14.8	3.7	15.8	0.	-	0.	-
(6) SOIL/SLOPE RESISTANCES	6.2	0.	27.4	4.7	12.1	2.1	0.2	7.4
(7) VISIBILITY LIMIT	8.5	6.9	19.7	13.5	0.	-	0.	-
(8) MANEUVER PROBLEMS	1.4	7.2	15.4	9.2	0.2	12.0	0.1	12.0
(9) VEGETATION RESISTANCES	8.7	6.5	18.7	9.5	0.	-	0.	-
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	0.4	4.7	9.5	8.6	0.6	7.8	0.	-
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	14.7	3.4	14.9	3.4	14.9
TM901-XM(130 mm)								
(1) INSUFFICIENT SOIL STRENGTH	0.3	NO-GO	0.	-	0.	-	98.9	NO-GO
(2) INSUFFICIENT TRACTION FOR SLOPES	1.2	NO-GO	0.	-	0.	NO-GO	1.1	NO-GO
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	5.8	NO-GO	5.0	NO-GO	2.4	NO-GO	0.2	NO-GO
(4) COMBINATION OF TERRAIN FACTORS	0.	-	0.	-	0.	-	0.	-
(5) ROUGHNESS (RIDE) SPEED LIMIT	2.4	16.8	4.2	15.0	0.3	12.7	1.4	12.0
(6) SOIL/SLOPE RESISTANCES	29.7	5.5	22.7	5.3	30.2	6.6	3.4	5.5
(7) VISIBILITY LIMIT	12.3	11.8	10.3	13.0	14.7	11.2	0.2	18.8
(8) MANEUVER PROBLEMS	14.8	8.1	16.4	8.3	16.3	7.0	0.1	12.8
(9) VEGETATION RESISTANCES	17.4	7.8	21.9	9.1	18.2	6.4	0.	-
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	7.3	8.7	10.0	8.5	14.5	6.5	0.1	7.8
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	14.7	3.4	14.9	3.4	14.9
MS20E1-XM204								
(1) INSUFFICIENT SOIL STRENGTH	0.8	NO-GO	0.	-	0.	-	0.	NO-GO
(2) INSUFFICIENT TRACTION FOR SLOPES	0.7	NO-GO	0.	-	0.	-	14.0	NO-GO
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	3.0	NO-GO	3.1	NO-GO	1.4	NO-GO	1.4	NO-GO
(4) COMBINATION OF TERRAIN FACTORS	0.	NO-GO	0.	NO-GO	0.	NO-GO	0.0	NO-GO
(5) ROUGHNESS (RIDE) SPEED LIMIT	17.1	9.5	17.4	9.5	45.1	7.6	19.4	7.2
(6) SOIL/SLOPE RESISTANCES	14.2	5.2	16.2	5.8	8.3	5.3	20.7	2.8
(7) VISIBILITY LIMIT	3.7	9.5	1.8	9.0	0.1	13.2	0.	-
(8) MANEUVER PROBLEMS	16.3	6.9	15.3	7.2	17.2	5.0	11.9	5.2
(9) VEGETATION RESISTANCES	9.3	6.9	10.9	7.3	2.4	7.4	3.2	3.9
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	26.0	3.4	25.8	3.4	22.1	2.1	9.0	2.2
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	14.7	3.4	14.9	3.4	14.9
MS20E1-XM198								
(1) INSUFFICIENT SOIL STRENGTH	0.8	NO-GO	0.	-	0.	-	08.1	NO-GO
(2) INSUFFICIENT TRACTION FOR SLOPES	0.7	NO-GO	0.	-	0.	-	0.3	NO-GO
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	2.9	NO-GO	3.1	NO-GO	1.4	NO-GO	0.2	NO-GO
(4) COMBINATION OF TERRAIN FACTORS	0.3	NO-GO	0.1	NO-GO	0.	-	0.4	NO-GO
(5) ROUGHNESS (RIDE) SPEED LIMIT	14.0	9.2	14.4	9.2	40.1	7.6	6.8	7.1
(6) SOIL/SLOPE RESISTANCES	22.0	4.3	23.7	4.4	12.4	4.5	8.7	4.5
(7) VISIBILITY LIMIT	3.7	8.9	1.9	10.0	0.1	9.1	0.	-
(8) MANEUVER PROBLEMS	15.0	6.8	14.3	6.4	17.6	5.3	1.8	3.8
(9) VEGETATION RESISTANCES	7.6	5.6	8.8	5.9	2.9	5.5	0.	-
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	23.4	3.1	24.3	3.1	22.0	2.0	2.3	2.0
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	14.7	3.4	14.9	3.4	14.9

(Continued)

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Table E87 (Continued)

Factors Limiting Speed	West Germany				Mid-East			
	Wet Condition		Snow Condition		Wet Condition		Snow Condition	
	% Area Limited	Average Speed, mph	% Area Limited	Average Speed, mph	% Area Limited	Average Speed, mph	% Area Limited	Average Speed, mph
MS20E1-PH70								
(1) INSUFFICIENT SOIL STRENGTH	77.9	NO-GO	0.	-	82.3	NO-GO	96.6	NO-GO
(2) INSUFFICIENT TRACTION FOR SLOPES	2.3	NO-GO	0.	-	1.2	NO-GO	0.	-
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	0.7	NO-GO	2.8	NO-GO	0.2	NO-GO	0.	-
(4) COMBINATION OF TERRAIN FACTORS	0.1	NO-GO	0.5	NO-GO	0.	NO-GO	0.	-
(5) ROUGHNESS (RIDE) SPEED LIMIT	0.6	7.9	13.4	9.1	0.2	7.8	0.	-
(6) SOIL/SLOPE RESISTANCES	5.1	2.1	26.4	3.9	11.3	2.6	0.	-
(7) VISIBILITY LIMIT	0.3	8.1	2.8	9.9	0.	6.0	0.	-
(8) MANEUVER PROBLEMS	1.8	4.7	16.4	4.3	0.3	6.0	0.	-
(9) VEGETATION RESISTANCES	0.3	1.1	5.9	5.4	0.	2.1	0.	-
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	1.5	2.3	24.7	3.1	1.0	2.1	0.	-
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	14.7	3.4	14.9	3.4	14.9
M125E1-XM198								
(1) INSUFFICIENT SOIL STRENGTH	0.8	NO-GO	0.	-	0.	NO-GO	82.6	NO-GO
(2) INSUFFICIENT TRACTION FOR SLOPES	0.7	NO-GO	4.2	NO-GO	0.	NO-GO	7.9	NO-GO
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	7.1	NO-GO	7.3	NO-GO	10.2	NO-GO	0.2	NO-GO
(4) COMBINATION OF TERRAIN FACTORS	0.	NO-GO	2.3	NO-GO	0.	NO-GO	0.	-
(5) ROUGHNESS (RIDE) SPEED LIMIT	6.0	12.5	2.3	11.4	18.8	8.6	0.	-
(6) SOIL/SLOPE RESISTANCES	27.0	6.9	37.1	8.	18.2	7.7	5.5	7.5
(7) VISIBILITY LIMIT	8.2	11.8	2.8	10.7	12.7	11.8	0.2	8.9
(8) MANEUVER PROBLEMS	15.1	7.7	12.2	5.1	5.0	7.3	0.2	8.8
(9) VEGETATION RESISTANCES	8.9	7.9	11.3	5.8	12.9	3.1	0.	-
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	16.7	5.6	11.1	5.3	3.4	14.9	3.4	14.9
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	14.7	3.4	14.9	3.4	14.9
MS48E1-XM204								
(1) INSUFFICIENT SOIL STRENGTH	0.	NO-GO	0.	-	0.	NO-GO	0.	-
(2) INSUFFICIENT TRACTION FOR SLOPES	1.2	NO-GO	9.5	NO-GO	0.2	NO-GO	11.8	NO-GO
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	9.9	NO-GO	0.	NO-GO	12.3	NO-GO	0.	-
(4) COMBINATION OF TERRAIN FACTORS	8.5	14.6	16.1	16.0	25.8	11.5	29.2	12.7
(5) ROUGHNESS (RIDE) SPEED LIMIT	12.1	7.3	2.4	18.8	7.1	6.3	21.3	4.7
(6) SOIL/SLOPE RESISTANCES	19.1	12.3	8.4	15.8	16.7	11.9	1.9	11.1
(7) VISIBILITY LIMIT	12.1	12.3	8.4	15.8	16.7	11.9	1.9	11.1
(8) MANEUVER PROBLEMS	19.1	9.8	22.2	12.2	16.8	9.3	15.3	7.7
(9) VEGETATION RESISTANCES	5.2	5.2	4.7	18.9	2.5	9.8	4.1	9.2
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	21.7	8.3	27.3	8.6	15.9	6.6	13.9	6.7
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	14.7	3.4	14.9	3.4	14.9
MS48E1-XM198								
(1) INSUFFICIENT SOIL STRENGTH	0.	NO-GO	0.	-	0.	NO-GO	0.	-
(2) INSUFFICIENT TRACTION FOR SLOPES	1.2	NO-GO	9.5	NO-GO	0.2	NO-GO	11.8	NO-GO
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	9.9	NO-GO	0.	NO-GO	12.3	NO-GO	0.	-
(4) COMBINATION OF TERRAIN FACTORS	8.5	14.6	16.1	16.0	25.8	11.5	29.2	12.7
(5) ROUGHNESS (RIDE) SPEED LIMIT	12.1	7.3	2.4	18.8	7.1	6.3	21.3	4.7
(6) SOIL/SLOPE RESISTANCES	19.1	12.3	8.4	15.8	16.7	11.9	1.9	11.1
(7) VISIBILITY LIMIT	12.1	12.3	8.4	15.8	16.7	11.9	1.9	11.1
(8) MANEUVER PROBLEMS	19.1	9.8	22.2	12.2	16.8	9.3	15.3	7.7
(9) VEGETATION RESISTANCES	5.2	5.2	4.7	18.9	2.5	9.8	4.1	9.2
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	21.7	8.3	27.3	8.6	15.9	6.6	13.9	6.7
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	14.7	3.4	14.9	3.4	14.9

(Continued)

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Table E87 (Continued)

Factors Limiting Speed	West Germany			Mid-East		
	Wet Condition		Snow Condition Average Speed, mph	Wet Condition		Sand Condition Average Speed, mph
	% Area Limited	% Area Speed, mph		% Area Limited	% Area Speed, mph	
MS48E1-FH70						
(1) INSUFFICIENT SOIL STRENGTH	78.1	NO-GO	-	82.6	NO-GO	-
(2) INSUFFICIENT TRACTION FOR SLOPES	8.3	NO-GO	-	0.3	NO-GO	6.7
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	1.4	NO-GO	-	0.6	NO-GO	11.8
(4) COMBINATION OF TERRAIN FACTORS	8.4	NO-GO	-	0.1	NO-GO	1.2
(5) ROUGHNESS (RIDE) SPEED LIMIT	14.8	NO-GO	15.9	0.1	NO-GO	14.8
(6) SOIL/SLOPE RESISTANCES	6.1	2.9	6.2	12.1	3.3	12.5
(7) VISIBILITY LIMIT	2.9	6.1	6.2	0.1	0.1	3.6
(8) MANEUVER PROBLEMS	6.4	6.1	14.8	0.1	0.1	2
(9) VEGETATION RESISTANCES	1.3	3.2	11.3	0.1	10.8	8.2
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	1.0	7.6	8.9	0.1	7.0	5.7
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	14.7	3.4	14.9	14.9
UET-DM198						
(1) INSUFFICIENT SOIL STRENGTH	8.0	NO-GO	-	8.0	-	-
(2) INSUFFICIENT TRACTION FOR SLOPES	8.8	NO-GO	-	8.0	-	-
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	8.0	NO-GO	-	13.8	NO-GO	13.4
(4) COMBINATION OF TERRAIN FACTORS	0.0	NO-GO	-	0.0	NO-GO	-
(5) ROUGHNESS (RIDE) SPEED LIMIT	2.2	17.6	18.4	18.9	13.2	9.1
(6) SOIL/SLOPE RESISTANCES	17.4	8.4	14.2	18.0	9.8	13.3
(7) VISIBILITY LIMIT	14.9	13.6	18.5	28.2	12.4	3.9
(8) MANEUVER PROBLEMS	16.5	9.5	18.5	18.5	17.8	7.9
(9) VEGETATION RESISTANCES	16.5	18.8	12.4	5.4	11.8	9.8
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	14.1	6.4	7.8	9.8	3.9	3.9
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	14.7	3.4	14.9	14.9
UET-FH70						
(1) INSUFFICIENT SOIL STRENGTH	77.9	NO-GO	-	82.3	NO-GO	-
(2) INSUFFICIENT TRACTION FOR SLOPES	8.1	NO-GO	-	0.2	NO-GO	-
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	1.7	NO-GO	-	1.1	NO-GO	12.7
(4) COMBINATION OF TERRAIN FACTORS	8.2	NO-GO	-	0.1	NO-GO	-
(5) ROUGHNESS (RIDE) SPEED LIMIT	5.9	18.5	18.5	0.1	NO-GO	-
(6) SOIL/SLOPE RESISTANCES	8.7	4.4	13.3	0.2	5.4	13.9
(7) VISIBILITY LIMIT	2.4	9.6	18.5	0.1	4.5	16.1
(8) MANEUVER PROBLEMS	1.1	7.1	12.1	0.1	1.4	8.2
(9) VEGETATION RESISTANCES	8.6	5.8	11.1	3.0	6.7	7.9
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	9.5	4.2	7.1	0.6	4.2	4.8
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	14.7	3.4	14.9	14.9
ASV-MK204						
(1) INSUFFICIENT SOIL STRENGTH	8.0	NO-GO	-	8.0	-	-
(2) INSUFFICIENT TRACTION FOR SLOPES	1.7	NO-GO	-	0.2	-	-
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	3.7	NO-GO	-	1.7	NO-GO	NO-GO
(4) COMBINATION OF TERRAIN FACTORS	0.8	NO-GO	-	0.0	-	-
(5) ROUGHNESS (RIDE) SPEED LIMIT	1.2	24.8	26.4	7.9	19.2	19.5
(6) SOIL/SLOPE RESISTANCES	12.6	5.3	10.5	12.9	18.0	6.4
(7) VISIBILITY LIMIT	26.5	19.4	20.9	27.5	12.4	15.4
(8) MANEUVER PROBLEMS	21.8	26.2	19.3	19.3	11.4	19.7
(9) VEGETATION RESISTANCES	12.8	18.0	12.6	6.8	7.8	10.1
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	15.5	7.6	10.5	16.1	16.1	7.9
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	14.7	3.4	14.9	14.9

(Continued)

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Table E87 (Continued)

Factors Limiting Speed	West Germany			Mid-East		
	Wet Condition		Snow Condition	Wet Condition		Sand Condition
	% Area Limited	Average Speed, mph		% Area Limited	Average Speed, mph	
ASV-XM198						
(1) INSUFFICIENT SOIL STRENGTH	0.	NO-GO	0.	0.	NO-GO	0.
(2) INSUFFICIENT TRACTION FOR SLOPES	1.7	NO-GO	0.	0.2	NO-GO	0.
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	1.7	NO-GO	3.7	1.7	NO-GO	1.2
(4) COMBINATION OF TERRAIN FACTORS	0.8	NO-GO	0.2	0.8	NO-GO	0.
(5) ROUGHNESS (RIDE) SPEED LIMIT	1.1	25.3	4.5	26.6	7.8	28.5
(6) SOIL/SLOPE RESISTANCES	16.8	6.7	6.8	20.9	6.1	44.3
(7) VISIBILITY LIMIT	17.5	13.8	19.1	20.1	12.6	15.2
(8) MANEUVER PROBLEMS	18.6	9.2	24.3	17.4	9.9	15.5
(9) VEGETATION RESISTANCES	16.9	9.2	12.8	6.3	8.8	9.2
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	13.3	8.7	19.2	17.4	7.5	14.8
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	3.4	14.9	14.9
ASV-FH70						
(1) INSUFFICIENT SOIL STRENGTH	77.9	NO-GO	0.	82.3	NO-GO	0.
(2) INSUFFICIENT TRACTION FOR SLOPES	0.1	NO-GO	0.	0.3	NO-GO	0.
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	0.9	NO-GO	3.7	0.2	NO-GO	1.2
(4) COMBINATION OF TERRAIN FACTORS	0.	NO-GO	8.2	0.	NO-GO	0.
(5) ROUGHNESS (RIDE) SPEED LIMIT	0.1	24.5	4.5	0.	NO-GO	0.
(6) SOIL/SLOPE RESISTANCES	6.6	4.0	7.3	12.5	4.9	28.5
(7) VISIBILITY LIMIT	0.8	18.1	18.7	44.4	14.1	4.9
(8) MANEUVER PROBLEMS	2.3	5.6	24.1	14.1	6.4	16.2
(9) VEGETATION RESISTANCES	1.0	7.0	12.9	0.2	15.4	7.4
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	0.8	7.3	19.2	0.6	8.5	8.6
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	3.4	14.9	14.9
M109A1						
(1) INSUFFICIENT SOIL STRENGTH	0.	NO-GO	0.	0.	NO-GO	0.
(2) INSUFFICIENT TRACTION FOR SLOPES	0.8	NO-GO	1.4	0.	NO-GO	0.
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	1.3	NO-GO	0.2	0.	NO-GO	0.
(4) COMBINATION OF TERRAIN FACTORS	0.5	NO-GO	3.8	0.	NO-GO	0.
(5) ROUGHNESS (RIDE) SPEED LIMIT	1.1	18.5	10.8	5.1	15.8	15.5
(6) SOIL/SLOPE RESISTANCES	15.1	8.9	13.6	15.7	18.2	41.3
(7) VISIBILITY LIMIT	15.2	12.5	10.8	24.3	12.1	7.1
(8) MANEUVER PROBLEMS	22.7	9.1	23.7	28.7	16.3	15.4
(9) VEGETATION RESISTANCES	11.2	7.7	11.8	4.7	18.6	8.5
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	22.7	9.9	14.0	25.3	6.3	18.1
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	3.4	14.9	14.9
M107						
(1) INSUFFICIENT SOIL STRENGTH	0.	NO-GO	0.	0.	NO-GO	0.
(2) INSUFFICIENT TRACTION FOR SLOPES	0.9	NO-GO	3.8	0.	NO-GO	0.
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	3.0	NO-GO	0.2	6.6	NO-GO	NO-GO
(4) COMBINATION OF TERRAIN FACTORS	0.7	NO-GO	18.7	0.	NO-GO	0.
(5) ROUGHNESS (RIDE) SPEED LIMIT	1.2	18.7	3.8	5.1	15.8	15.5
(6) SOIL/SLOPE RESISTANCES	15.0	8.5	10.8	14.9	18.0	7.3
(7) VISIBILITY LIMIT	15.3	12.3	10.8	24.3	11.9	15.4
(8) MANEUVER PROBLEMS	22.4	8.6	24.8	20.3	10.2	8.3
(9) VEGETATION RESISTANCES	11.2	9.0	4.9	5.5	8.4	9.2
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	20.7	10.7	32.1	19.9	9.3	14.7
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	3.4	14.9	14.9

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Table E87 (Continued)

Factors Limiting Speed	West Germany				Mid-East			
	Wet Condition		Snow Condition		Wet Condition		Sand Condition	
	% Area Limited	Average Speed, mph	% Area Limited	Average Speed, mph	% Area Limited	Average Speed, mph	% Area Limited	Average Speed, mph
M10E2								
(1) INSUFFICIENT SOIL STRENGTH	9.9	MO-60	0.0	-	0.0	-	0.0	-
(2) INSUFFICIENT TRACTION FOR SLOPES	0.9	MO-60	0.0	-	0.0	-	0.0	-
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	1.4	MO-60	1.4	MO-60	0.0	MO-60	0.5	MO-60
(4) COMBINATION OF TERRAIN FACTORS	0.7	MO-60	0.2	MO-60	0.0	-	0.0	-
(5) ROUGHNESS (RIDE) SPEED LIMIT	1.2	10.7	3.6	20.2	5.1	15.6	7.7	15.5
(6) SOIL/SLOPE RESISTANCES	15.8	8.4	10.0	13.4	14.9	10.0	42.5	7.0
(7) VISIBILITY LIMIT	13.3	12.3	10.8	17.5	24.3	11.9	4.9	15.4
(8) MANEUVER PROBLEMS	22.4	6.4	24.8	11.5	28.7	10.3	16.4	8.3
(9) VEGETATION RESISTANCES	11.3	8.9	4.9	10.9	5.5	8.4	6.1	9.2
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	22.3	10.0	33.4	11.5	25.3	6.2	10.5	8.4
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	14.7	3.4	14.9	3.4	14.9
M113A1								
(1) INSUFFICIENT SOIL STRENGTH	0.0	MO-60	0.0	-	0.0	-	0.0	-
(2) INSUFFICIENT TRACTION FOR SLOPES	1.4	MO-60	0.0	-	0.0	MO-60	0.0	MO-60
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	6.7	MO-60	6.6	MO-60	13.7	MO-60	9.1	MO-60
(4) COMBINATION OF TERRAIN FACTORS	0.6	MO-60	0.0	MO-60	0.0	-	0.0	-
(5) ROUGHNESS (RIDE) SPEED LIMIT	3.7	10.4	8.3	18.4	19.9	13.3	24.8	14.2
(6) SOIL/SLOPE RESISTANCES	5.4	11.4	4.5	16.6	3.2	9.2	24.8	7.8
(7) VISIBILITY LIMIT	23.1	13.1	17.0	18.8	29.5	11.8	4.7	14.8
(8) MANEUVER PROBLEMS	23.3	10.5	23.1	13.1	16.0	11.5	19.9	10.7
(9) VEGETATION RESISTANCES	9.3	7.8	2.6	11.4	3.8	4.1	3.5	12.7
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	22.9	8.3	20.3	9.5	10.3	6.1	14.6	5.5
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	14.7	3.4	14.9	3.4	14.9
M60A2								
(1) INSUFFICIENT SOIL STRENGTH	0.0	MO-60	0.0	-	0.0	-	0.0	-
(2) INSUFFICIENT TRACTION FOR SLOPES	0.9	MO-60	0.0	MO-60	0.0	MO-60	0.5	MO-60
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	4.1	MO-60	2.5	MO-60	9.1	MO-60	0.5	MO-60
(4) COMBINATION OF TERRAIN FACTORS	0.0	MO-60	0.4	MO-60	0.2	MO-60	0.5	MO-60
(5) ROUGHNESS (RIDE) SPEED LIMIT	6.7	10.3	2.0	19.4	16.5	7.9	15.5	15.5
(6) SOIL/SLOPE RESISTANCES	15.9	11.5	13.4	22.8	10.6	12.2	32.8	9.2
(7) VISIBILITY LIMIT	19.0	13.7	15.5	18.8	24.3	11.9	4.5	15.4
(8) MANEUVER PROBLEMS	23.3	8.7	20.7	11.5	21.8	8.1	1.0	13.4
(9) VEGETATION RESISTANCES	9.3	8.3	15.3	13.2	6.2	10.4	8.6	13.4
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	16.3	5.7	20.6	5.8	16.1	4.3	23.1	3.7
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	14.7	3.4	14.9	3.4	14.9
M548E1								
(1) INSUFFICIENT SOIL STRENGTH	0.0	MO-60	0.0	-	0.0	-	0.0	-
(2) INSUFFICIENT TRACTION FOR SLOPES	1.2	MO-60	0.0	-	0.0	MO-60	0.0	MO-60
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	9.9	MO-60	9.5	MO-60	12.3	MO-60	11.8	MO-60
(4) COMBINATION OF TERRAIN FACTORS	0.6	MO-60	0.0	MO-60	0.2	MO-60	0.0	MO-60
(5) ROUGHNESS (RIDE) SPEED LIMIT	8.8	14.6	17.5	16.0	25.2	13.0	32.4	13.8
(6) SOIL/SLOPE RESISTANCES	6.2	9.6	1.0	11.2	3.3	11.2	1.1	11.1
(7) VISIBILITY LIMIT	14.4	12.1	15.2	15.2	20.7	11.2	4.5	15.4
(8) MANEUVER PROBLEMS	21.6	10.2	21.8	12.4	16.9	9.6	15.2	8.3
(9) VEGETATION RESISTANCES	4.0	7.3	3.3	11.5	2.3	4.3	3.9	9.7
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	23.7	9.1	28.1	9.6	15.0	7.2	13.1	7.7
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	14.7	3.4	14.9	3.4	14.9

(Continued)

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Table E87 (Continued)

Factors Limiting Speed	West Germany			Mid-East		
	Wet Condition		Snow Condition	Wet Condition		Sand Condition
	% Area Limited	Average Speed, mph		% Area Limited	Average Speed, mph	
MS77A1						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	0.	-	-
(2) INSUFFICIENT TRACTION FOR SLOPES	1.4	NO-GO	0.	0.2	NO-GO	-
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	6.7	NO-GO	6.6	14.4	NO-GO	NO-GO
(4) COMBINATION OF TERRAIN FACTORS	0.7	NO-GO	0.	0.	NO-GO	0.
(5) ROUGHNESS (RIDE) SPEED LIMIT	3.7	16.4	8.2	19.1	13.3	24.7
(6) SOIL/SLOPE RESISTANCES	5.6	11.3	4.5	3.3	9.9	14.2
(7) VISIBILITY LIMIT	20.7	13.1	16.9	29.5	11.6	7.3
(8) MANEUVER PROBLEMS	23.0	10.6	22.9	16.9	11.4	14.8
(9) VEGETATION RESISTANCES	7.2	9.7	3.0	11.3	11.4	15.9
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	21.6	8.1	28.3	9.6	6.2	5.4
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	3.4	14.9	14.9
XM723						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	0.	-	-
(2) INSUFFICIENT TRACTION FOR SLOPES	2.1	NO-GO	0.	0.2	NO-GO	0.
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	2.3	NO-GO	2.2	6.8	NO-GO	NO-GO
(4) COMBINATION OF TERRAIN FACTORS	1.0	NO-GO	0.2	0.9	NO-GO	0.
(5) ROUGHNESS (RIDE) SPEED LIMIT	1.4	26.0	5.3	26.8	28.2	14.4
(6) SOIL/SLOPE RESISTANCES	7.3	12.2	3.2	3.9	6.8	25.8
(7) VISIBILITY LIMIT	25.6	13.5	20.7	33.5	12.5	7.4
(8) MANEUVER PROBLEMS	26.6	9.1	27.9	22.6	11.0	15.9
(9) VEGETATION RESISTANCES	7.6	5.0	7.1	3.2	2.9	16.8
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	16.7	9.6	23.6	16.9	9.1	8.7
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	3.4	14.9	14.9
XM1						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	0.	-	-
(2) INSUFFICIENT TRACTION FOR SLOPES	0.8	NO-GO	0.	0.	-	-
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	1.8	NO-GO	1.9	4.0	NO-GO	NO-GO
(4) COMBINATION OF TERRAIN FACTORS	0.5	NO-GO	0.4	0.	-	0.
(5) ROUGHNESS (RIDE) SPEED LIMIT	1.1	22.9	2.0	16.7	12.1	16.4
(6) SOIL/SLOPE RESISTANCES	4.8	17.5	2.3	1.4	16.5	16.2
(7) VISIBILITY LIMIT	36.9	16.2	38.5	38.1	14.5	17.8
(8) MANEUVER PROBLEMS	27.8	10.9	28.0	19.6	10.5	13.8
(9) VEGETATION RESISTANCES	6.9	13.1	5.2	1.5	17.9	21.8
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	10.8	9.9	12.1	21.8	9.1	9.3
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	3.4	14.9	14.9
ASV						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	0.	-	-
(2) INSUFFICIENT TRACTION FOR SLOPES	1.7	NO-GO	0.	0.2	NO-GO	0.
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	3.7	NO-GO	3.7	1.7	NO-GO	NO-GO
(4) COMBINATION OF TERRAIN FACTORS	0.8	NO-GO	0.2	0.8	NO-GO	NO-GO
(5) ROUGHNESS (RIDE) SPEED LIMIT	1.3	25.5	4.9	5.8	19.8	19.5
(6) SOIL/SLOPE RESISTANCES	11.1	8.9	4.6	10.7	8.9	7.1
(7) VISIBILITY LIMIT	23.5	13.4	19.5	32.4	12.3	15.8
(8) MANEUVER PROBLEMS	22.9	8.9	26.1	19.3	11.6	15.8
(9) VEGETATION RESISTANCES	10.5	8.8	10.0	6.3	8.2	11.7
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	15.1	9.8	21.5	19.5	8.4	16.4
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	3.4	14.9	14.9

(Continued)

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Table E87 (Concluded)

Factors Limiting Speed	West Germany			Mid-East		
	Wet Condition		Snow Condition	Wet Condition		Sand Condition
	% Area Limited	Average Speed, mph		% Area Limited	Average Speed, mph	
M561						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	0.	-	NO-60
(2) INSUFFICIENT TRACTION FOR SLOPES	0.	-	0.	0.	-	NO-60
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	9.2	NO-60	9.2	16.3	NO-60	NO-60
(4) COMBINATION OF TERRAIN FACTORS	0.	-	0.	0.	-	NO-60
(5) ROUGHNESS (RIDE) SPEED LIMIT	12.9	15.5	15.7	30.2	11.6	13.5
(6) SOIL/SLOPE RESISTANCES	1.1	15.4	5.3	14.1	7.3	12.6
(7) VISIBILITY LIMIT	14.3	12.6	7.2	14.0	11.9	13.6
(8) MANEUVER PROBLEMS	24.7	10.9	23.1	16.4	13.2	11.7
(9) VEGETATION RESISTANCES	1.2	14.1	2.5	0.9	14.3	13.1
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	27.8	9.7	27.5	12.3	7.2	9.3
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	3.4	14.9	14.9
M013						
(1) INSUFFICIENT SOIL STRENGTH	0.2	NO-60	0.	0.	-	NO-60
(2) INSUFFICIENT TRACTION FOR SLOPES	8.1	NO-60	8.	0.	-	NO-60
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	7.7	NO-60	7.7	10.0	NO-60	NO-60
(4) COMBINATION OF TERRAIN FACTORS	0.	-	0.	0.	-	NO-60
(5) ROUGHNESS (RIDE) SPEED LIMIT	14.9	12.5	7.6	37.1	6.6	10.2
(6) SOIL/SLOPE RESISTANCES	7.6	9.6	34.6	2.9	7.8	8.0
(7) VISIBILITY LIMIT	10.7	12.6	3.8	14.4	12.8	13.5
(8) MANEUVER PROBLEMS	19.9	10.7	13.0	16.0	9.4	13.5
(9) VEGETATION RESISTANCES	7.8	9.2	9.3	1.6	10.7	13.9
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	22.4	6.5	15.3	13.7	3.5	3.2
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	3.4	14.9	14.9
UET						
(1) INSUFFICIENT SOIL STRENGTH	0.	-	0.	0.	-	-
(2) INSUFFICIENT TRACTION FOR SLOPES	1.2	NO-60	0.	0.	-	NO-60
(3) OBSTACLE INTERFERENCE OR INSUFFICIENT OBSTACLE TRACTION	9.2	NO-60	5.8	9.5	NO-60	NO-60
(4) COMBINATION OF TERRAIN FACTORS	0.1	NO-60	0.	0.2	NO-60	-
(5) ROUGHNESS (RIDE) SPEED LIMIT	2.9	18.2	6.9	13.7	13.5	13.5
(6) SOIL/SLOPE RESISTANCES	17.4	7.7	12.6	9.9	10.7	15.0
(7) VISIBILITY LIMIT	28.9	13.7	24.5	31.5	12.1	15.0
(8) MANEUVER PROBLEMS	22.6	18.2	27.2	17.8	11.5	11.4
(9) VEGETATION RESISTANCES	7.8	5.4	8.2	4.4	5.8	13.1
(10) OBSTACLE CROSSING SPEED AND AC/DC BETWEEN OBSTACLES	4.3	9.5	9.9	18.4	10.8	10.8
(11) EXTERNAL (URBAN) SPEED LIMIT	9.5	14.7	9.5	3.4	14.9	14.9

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Table 1.88

[illegible]

Table E89

Speed Profile for Group 2

Primary Roads			Secondary Roads			Trails			Off-Road		
PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE		
X=0	2	4	X=0	2	4	X=0	2	4	X=0	2	4
1X 43.0	43.0	43.0	1X 36.9	36.3	35.4	1X 24.2	23.3	22.4	1X 20.0	20.0	16.0
1X 43.0	43.0	43.0	1X 34.0	34.6	34.3	1X 20.3	19.0	19.3	1X 16.1	15.7	15.4
2X 43.0	43.0	43.0	2X 33.2	32.9	32.6	2X 18.5	18.3	18.1	2X 14.5	14.2	13.9
3X 42.0	42.7	42.6	3X 32.0	31.7	31.4	3X 17.5	17.2	17.0	3X 13.1	12.9	12.7
4X 42.7	41.9	41.5	4X 30.4	29.9	29.5	4X 15.9	15.5	15.2	4X 12.1	12.0	11.9
5X 42.4	41.5	41.1	5X 28.4	28.1	27.8	5X 14.4	14.2	14.1	5X 11.5	11.4	11.3
6X 42.2	41.6	41.3	6X 26.8	26.5	26.3	6X 13.0	12.8	12.7	6X 10.9	10.8	10.7
7X 42.2	41.6	41.3	7X 25.5	25.3	25.0	7X 12.9	12.8	12.4	7X 10.2	10.1	9.7
8X 42.2	41.6	41.3	8X 23.9	23.5	23.1	8X 11.1	10.7	10.4	8X 9.3	9.1	8.6
9X 42.3	41.7	41.4	9X 22.0	21.6	21.2	9X 9.5	9.3	9.1	9X 7.7	7.5	7.1
10X 24.6	24.6	24.6	10X 19.6	19.6	19.6	10X 1.8	1.8	1.8	10X 0.8	0.8	0.8

PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE		
X=0	2	4	X=0	2	4	X=0	2	4	X=0	2	4
1X 18.9	18.9	18.9	1X 13.1	12.5	11.9	1X 8.0	8.0	8.0	1X 20.0	20.0	17.2
2X 18.0	18.4	18.1	2X 8.7	8.5	8.4	2X 6.6	6.6	6.6	1X 13.9	13.7	13.5
3X 18.0	18.4	18.1	3X 8.2	8.2	8.1	3X 6.6	6.6	6.6	2X 8.0	8.0	8.1
4X 18.0	18.4	18.1	4X 8.0	8.0	8.0	4X 6.6	6.6	6.6	3X 7.8	7.6	7.5
5X 18.0	18.4	18.1	5X 7.9	7.9	7.8	5X 6.5	6.5	6.5	4X 7.2	7.2	7.1
6X 18.0	18.4	18.1	6X 7.6	7.6	7.6	6X 6.4	6.4	6.4	5X 6.9	6.8	6.7
7X 18.0	18.4	18.1	7X 7.7	7.7	7.7	7X 6.3	6.3	6.2	6X 6.5	6.4	6.3
8X 18.0	18.4	18.1	8X 7.6	7.6	7.6	8X 6.2	6.2	6.1	7X 5.9	5.7	5.7
9X 18.0	18.4	18.1	9X 7.5	7.5	7.5	9X 5.8	5.8	5.9	8X 5.9	5.8	5.7
10X 7.4	7.4	7.4	10X 1.3	1.3	1.3	10X 1.2	1.2	1.2	9X 5.5	5.4	5.4

PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE		
X=0	2	4	X=0	2	4	X=0	2	4	X=0	2	4
1X 41.8	41.0	41.0	1X 34.7	34.4	34.4	1X 23.4	23.4	23.0	1X 17.5	16.9	15.5
2X 41.0	41.0	41.0	2X 34.4	34.4	34.4	2X 21.0	20.9	20.3	2X 14.7	14.5	14.1
3X 41.0	41.0	41.0	3X 34.2	33.9	33.5	3X 19.1	18.9	18.7	3X 13.4	13.3	13.1
4X 41.0	41.0	41.0	4X 32.7	32.5	32.3	4X 17.6	17.6	17.4	4X 12.4	12.4	12.3
5X 41.0	41.0	41.0	5X 31.3	31.2	31.0	5X 15.5	15.2	15.0	5X 11.4	11.7	11.5
6X 41.0	41.0	41.0	6X 30.2	30.0	29.7	6X 14.4	14.2	14.1	6X 10.0	10.7	10.5
7X 41.0	41.0	41.0	7X 28.6	27.7	27.4	7X 13.7	13.6	13.5	7X 9.1	9.0	8.7
8X 41.0	41.0	41.0	8X 27.2	26.8	26.1	8X 13.1	12.9	12.5	8X 7.9	7.8	7.5
9X 41.0	41.0	41.0	9X 24.2	23.7	23.2	9X 11.2	10.9	10.5	9X 1.2	1.2	1.2
10X 27.2	27.2	27.2	10X 1.9	1.9	1.9	10X 0.7	0.7	0.7	10X 0.4	0.4	0.4

PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE		
X=0	2	4	X=0	2	4	X=0	2	4	X=0	2	4
1X 41.0	41.0	41.0	1X 32.7	32.7	32.7	1X 18.2	18.1	18.1	1X 15.0	15.0	15.0
2X 41.0	41.0	41.0	2X 32.4	32.1	31.9	2X 16.1	16.1	16.1	2X 14.2	14.1	14.1
3X 41.0	41.0	41.0	3X 31.4	31.3	31.1	3X 14.1	14.1	14.1	3X 13.1	13.1	13.1
4X 41.0	41.0	41.0	4X 30.0	30.0	30.0	4X 13.1	13.1	13.1	4X 12.1	12.1	12.1
5X 41.0	41.0	41.0	5X 29.0	29.0	29.0	5X 12.1	12.1	12.1	5X 11.1	11.1	11.1
6X 41.0	41.0	41.0	6X 28.0	28.0	28.0	6X 11.1	11.1	11.1	6X 10.1	10.1	10.1
7X 41.0	41.0	41.0	7X 26.5	26.5	26.5	7X 10.1	10.1	10.1	7X 9.1	9.1	9.1
8X 41.0	41.0	41.0	8X 21.9	21.2	20.6	8X 9.1	9.1	9.1	8X 8.1	8.1	8.1
9X 41.0	41.0	41.0	9X 19.0	18.7	18.7	9X 8.1	8.1	8.1	9X 7.1	7.1	7.1
10X 26.7	26.7	26.7	10X 1.8	1.8	1.8	10X 0.1	0.1	0.1	10X 0.1	0.1	0.1

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Table 290

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Table E91

Speed Profile for Group 4

Primary Roads			Secondary Roads			Trails			Off-Road		
PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE		
X=0	2	4	X=0	2	4	X=0	2	4	X=0	2	4
1A 48.0	48.0	48.0	1A 48.0	48.0	48.0	1A 48.0	48.0	48.0	1A 48.0	48.0	48.0
1B 48.0	48.0	48.0	1B 48.0	48.0	48.0	1B 48.0	48.0	48.0	1B 48.0	48.0	48.0
2A 48.0	48.0	48.0	2A 48.0	48.0	48.0	2A 48.0	48.0	48.0	2A 48.0	48.0	48.0
3A 48.0	48.0	48.0	3A 48.0	48.0	48.0	3A 48.0	48.0	48.0	3A 48.0	48.0	48.0
4A 48.0	48.0	48.0	4A 48.0	48.0	48.0	4A 48.0	48.0	48.0	4A 48.0	48.0	48.0
5A 48.0	48.0	48.0	5A 48.0	48.0	48.0	5A 48.0	48.0	48.0	5A 48.0	48.0	48.0
6A 48.0	48.0	48.0	6A 48.0	48.0	48.0	6A 48.0	48.0	48.0	6A 48.0	48.0	48.0
7A 48.0	48.0	48.0	7A 48.0	48.0	48.0	7A 48.0	48.0	48.0	7A 48.0	48.0	48.0
8A 48.0	48.0	48.0	8A 48.0	48.0	48.0	8A 48.0	48.0	48.0	8A 48.0	48.0	48.0
9A 48.0	48.0	48.0	9A 48.0	48.0	48.0	9A 48.0	48.0	48.0	9A 48.0	48.0	48.0
10A 48.0	48.0	48.0	10A 48.0	48.0	48.0	10A 48.0	48.0	48.0	10A 48.0	48.0	48.0

West Germany - Wet Condition			West Germany - Snow Condition		
PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE		
X=0	2	4	X=0	2	4
1A 48.0	48.0	48.0	1A 48.0	48.0	48.0
1B 48.0	48.0	48.0	1B 48.0	48.0	48.0
2A 48.0	48.0	48.0	2A 48.0	48.0	48.0
3A 48.0	48.0	48.0	3A 48.0	48.0	48.0
4A 48.0	48.0	48.0	4A 48.0	48.0	48.0
5A 48.0	48.0	48.0	5A 48.0	48.0	48.0
6A 48.0	48.0	48.0	6A 48.0	48.0	48.0
7A 48.0	48.0	48.0	7A 48.0	48.0	48.0
8A 48.0	48.0	48.0	8A 48.0	48.0	48.0
9A 48.0	48.0	48.0	9A 48.0	48.0	48.0
10A 48.0	48.0	48.0	10A 48.0	48.0	48.0

Mid-East - Wet Condition			Mid-East - Sand Condition		
PERCENT TOTAL DISTANCE			PERCENT TOTAL DISTANCE		
X=0	2	4	X=0	2	4
1A 48.0	48.0	48.0	1A 48.0	48.0	48.0
1B 48.0	48.0	48.0	1B 48.0	48.0	48.0
2A 48.0	48.0	48.0	2A 48.0	48.0	48.0
3A 48.0	48.0	48.0	3A 48.0	48.0	48.0
4A 48.0	48.0	48.0	4A 48.0	48.0	48.0
5A 48.0	48.0	48.0	5A 48.0	48.0	48.0
6A 48.0	48.0	48.0	6A 48.0	48.0	48.0
7A 48.0	48.0	48.0	7A 48.0	48.0	48.0
8A 48.0	48.0	48.0	8A 48.0	48.0	48.0
9A 48.0	48.0	48.0	9A 48.0	48.0	48.0
10A 48.0	48.0	48.0	10A 48.0	48.0	48.0

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Table E92
Time for Study Prime Mover-Towed Artillery Combinations to Complete Selected Artillery Mission

Prime Mover	Time, min											
	Lightweight Artillery				Medium-Weight Artillery				Heavyweight Artillery			
	3340-lb M102		4775-lb XM204		12700-lb M114A1		15150-lb XM198		16590-lb XM(130-mm)		19250-lb FH70	
	Wet Condition	Snow Condition	Wet Condition	Snow Condition	Wet Condition	Snow Condition	Wet Condition	Snow Condition	Wet Condition	Snow Condition	Wet Condition	Snow Condition
Mission 1 - 2.06 Miles												
M561	5.9	6.9	6.2	7.3			60.8	67.9				
M35A2	59.0	11.2	59.1	11.6			60.1	72.8				
M813			59.1	12.7	59.6	15.1	59.8	16.9	60.0	18.5	60.3	76.2
M656			6.0	7.4			60.1	9.0				
TDW901			7.9	8.5	10.3	9.3	61.9	9.6	62.0	9.7	62.3	10.0
M520E1			61.4	10.3			62.3	12.2			62.9	12.8
M125E1							60.6	4.7				
M548E1			6.1	6.0			7.8	6.3			60.2	6.3
UET							7.1	6.2			60.2	6.4
ASV			5.8	5.6			6.6	5.8			59.6	5.9
Mission 2 - 1.60 Miles												
M561	17.1	10.1	17.9	16.5			174.6	76.6				
M35A2	57.6	17.0	76.5	17.6			173.7	80.4				
M813			169.3	18.6	174.1	21.2	174.1	62.4	174.1	63.0	174.3	80.6
M656			15.8	8.9			78.4	16.8				
TDW901			10.7	8.3	60.6	9.0	63.3	9.6	173.6	9.9	168.4	9.9
M520E1			170.6	12.1			176.2	12.8			176.4	13.4
M125E1							173.8	21.2				
M548E1			16.4	9.0			60.3	9.1			168.9	9.1
UET							18.3	7.1			167.6	7.1
ASV			13.7	6.0			15.9	6.0			167.0	6.0
Mission 3 - 3.07 Miles												
M561	53.7	52.4	56.0	52.8			172.6	63.5				
M35A2	18.4	18.2	23.9	19.4			166.5	73.8				
M813			126.3	59.9	165.9	65.1	166.0	68.7	166.1	69.1	166.3	75.7
M656			13.2	11.2			29.1	13.8				
TDW901			18.3	11.9	31.2	13.1	39.6	13.4	132.7	13.6	168.0	14.1
M520E1			167.4	16.8			167.7	18.9			167.9	19.7
M125E1							166.6	22.9				
M548E1			54.6	51.8			66.9	51.8			166.4	51.8
UET							59.6	50.3			166.2	50.3
ASV			12.8	7.5			19.0	7.6			165.8	7.6
Mission 4 - 2.80 Miles												
M561	10.3	103.0	13.3	70.2			185.5	128.8				
M35A2	70.8	74.5	81.2	75.8			184.5	134.8				
M813			184.5	76.1	184.2	79.0	184.3	82.3	184.5	84.4	183.3	142.3
M656			103.0	103.0			81.9	72.2				
TDW901			14.8	11.8	81.4	13.5	80.9	14.3	186.2	14.7	184.5	158.0
M520E1			185.8	156.0			186.1	18.3			184.3	19.4
M125E1							185.4	79.2				
M548E1			12.2	9.4			20.3	9.8			183.2	10.0
UET							14.8	8.5			183.5	8.7
ASV			10.6	7.5			14.8	7.7			183.1	7.9
Mission 5 - 2.72 Miles												
M561	51.1	51.0	54.6	74.0			248.0	193.4				
M35A2	72.3	75.9	74.4	76.7			248.2	199.4				
M813			130.7	78.3	247.8	81.9	247.9	143.0	248.0	143.3	284.2	145.0
M656			50.1	50.0			77.7	74.9				
TDW901			22.0	50.0	84.5	51.5	80.5	52.6	137.0	53.1	284.9	54.1
M520E1			250.6	55.6			250.9	57.9			287.0	59.1
M125E1							247.9	81.1				
M548E1			51.4	49.6			71.2	50.2			284.8	50.3
UET							53.8	47.6			283.4	47.8
ASV			49.2	46.5			53.3	46.5			282.8	46.6
Mission 6 - 2.52 Miles												
M561	12.3	10.5	14.5	10.9			184.5	71.6				
M35A2	16.8	14.4	22.0	15.5			124.9	78.1				
M813			124.4	16.1	124.7	20.0	124.7	22.6	124.8	23.0	184.1	82.0
M656			12.5	100.0			27.5	12.1				
TDW901			17.6	10.8	29.5	11.7	37.4	12.0	125.4	12.2	184.8	12.5
M520E1			125.7	14.5			126.1	16.0			185.2	16.9
M125E1							124.9	18.6				
M548E1			13.3	10.1			25.5	10.2			184.5	10.3
UET							18.1	8.4			184.1	8.5
ASV			13.0	7.2			19.2	7.3			184.2	7.4
Mission 7 - 2.31 Miles												
M561	9.9	8.5	11.3	8.9			124.0	112.0				
M35A2	15.2	12.7	28.4	13.4			123.5	118.7				
M813			123.4	14.4	123.5	17.8	123.5	20.7	123.6	21.7	123.8	51.2
M656			10.3	8.3			79.1	10.4				
TDW901			14.4	9.3	24.7	10.3	33.2	10.6	124.1	10.7	124.6	11.1
M520E1			124.7	12.7			124.9	14.7			125.1	15.3
M125E1							123.8	16.8			124.0	8.0
M548E1			10.9	7.9			21.2	8.0			123.6	6.7
UET							14.7	6.7			123.3	5.5
ASV			10.3	5.3			15.3	5.4				

(Continued)

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Table E92 (Continued)

Time, min												
Prime Mover	Lightweight Artillery				Medium-Weight Artillery				Heavyweight Artillery			
	3340-lb		4775-lb		12700-lb		15250-lb		16590-lb		19250-lb	
	M102		XM204		M114A1		XM198		XM(130-mm)		FH70	
	Wet	Snow	Wet	Snow	Wet	Snow	Wet	Snow	Wet	Snow	Wet	Snow
Condition	Condition	Condition	Condition	Condition	Condition	Condition	Condition	Condition	Condition	Condition	Condition	Condition
Mission 8 - 3.07 Miles												
M561	8.4	10.1	8.6	10.8			80.5	91.1				
M35A2	8.0	15.2	8.1	16.2			9.3	98.0				
M813			8.1	16.4	8.5	85.5	8.7	102.0	8.8	102.0	68.5	102.1
M656			8.4	10.6			8.9	13.3				
TDW901			9.7	12.0	11.1	12.8	11.4	13.2	11.5	13.4	71.0	13.7
MS20E1			10.7	13.6			11.2	15.9			70.6	16.2
M125E1							9.9	19.1				
MS48E1			8.9	9.4			9.1	9.4			68.3	9.5
UET							9.0	9.5			68.4	9.5
ASV			8.1	8.8			8.2	8.8			67.5	8.9
Mission 9 - 2.25 Miles												
M561	16.9	10.6	18.8	11.6			69.3	71.9				
M35A2	70.7	19.6	72.9	61.5			73.2	75.1				
M813			66.2	15.5	72.2	82.3	72.3	81.6	72.4	81.9	67.3	76.0
M656			11.0	10.3			81.1	18.6				
TDW901			14.3	11.0	57.0	12.2	85.8	12.9	73.5	18.8	68.5	13.8
MS20E1			70.0	15.6			75.3	23.6			70.4	24.4
M125E1							72.6	24.5				
MS48E1			18.1	9.7			25.6	10.3			68.5	10.9
UET							20.3	8.6			66.7	8.7
ASV			17.0	7.3			21.0	7.7			66.8	7.9
Mission 10 - 2.50 Miles												
M561	11.1	12.0	64.8	12.3			171.6	68.1				
M35A2	11.2	15.2	12.0	68.7			170.9	73.5				
M813			117.8	17.0	118.3	72.1	119.6	74.1	120.7	74.2	118.4	74.4
M656			10.8	11.8			66.7	13.3				
TDW901			12.3	12.2	15.0	13.0	16.6	13.3	119.0	13.4	119.3	13.7
MS20E1			119.6	14.9			120.5	16.6			120.3	17.1
M125E1							118.5	18.8				
MS48E1			11.4	10.9			14.2	10.9			118.1	11.0
UET							12.2	10.6			117.8	10.6
ASV			11.1	9.8			12.2	9.9			117.3	10.0
Mission 11 - 2.80 Miles												
M561	68.2	10.5	69.3	69.9			206.0	255.7				
M35A2	46.9	133.3	52.4	133.9			205.1	262.3				
M813			164.3	78.3	204.2	138.2	204.4	140.4	204.6	140.6	164.3	142.8
M656			10.8	10.7			195.8	130.6				
TDW901			13.9	12.2	54.4	14.6	96.4	17.1	207.4	74.3	167.3	22.1
MS20E1			181.0	15.2			207.5	76.7			168.0	80.3
M125E1							205.4	137.5				
MS48E1			69.2	8.8			73.7	9.5			164.9	9.7
UET							71.0	8.8			163.9	8.9
ASV			68.6	7.8			70.8	8.0			163.4	8.2
Mission 12 - 1.64 Miles												
M561	8.5	6.9	10.1	7.2			175.4	145.9				
M35A2	12.1	10.8	16.7	12.7			176.6	151.7				
M813			123.1	12.3	124.2	76.7	125.0	153.2	125.3	150.6	124.6	151.0
M656			8.9	7.0			83.1	9.2				
TDW901			11.9	7.6	19.4	8.6	25.7	9.2	124.1	9.4	125.3	9.6
MS20E1			125.7	11.9			126.4	13.7			126.9	14.3
M125E1							124.1	14.9				
MS48E1			9.8	6.6			76.7	7.1			125.2	7.1
UET							13.2	5.9			124.1	5.9
ASV			10.2	5.1			14.2	5.5			124.0	5.6
Mission 13 - 2.11 Miles												
M561	66.3	66.8	66.3	66.9			108.1	151.2				
M35A2	66.8	68.4	69.5	68.6			108.0	153.1				
M813			107.7	69.0	107.8	70.5	107.8	111.7	107.9	111.7	107.9	111.8
M656			66.4	66.9			108.0	67.6				
TDW901			8.9	9.2	10.3	9.5	11.4	9.6	53.6	9.7	108.6	9.8
MS20E1			108.4	13.0			108.6	13.9			108.7	14.1
M125E1							108.1	69.8				
MS48E1			66.5	66.5			67.4	66.5			108.0	66.7
UET							66.8	66.5			107.9	66.6
ASV			7.6	7.8			8.0	7.8			107.8	7.8
Mission 14 - 2.94 Miles												
M561	7.7	9.4	7.8	10.1			62.4	66.8				
M35A2	7.6	14.4	7.6	15.3			8.4	73.3				
M813			7.9	15.6	8.0	19.3	8.2	24.0	8.3	24.0	8.3	26.0
M656			7.9	10.0			8.3	12.6				
TDW901			8.8	11.4	9.7	12.0	10.1	12.5	10.3	12.7	10.7	13.0
MS20E1			9.3	12.8			9.7	15.0			10.0	15.2
M125E1							9.5	18.0				
MS48E1			8.4	8.5			8.5	8.5			8.4	8.6
UET							9.0	9.0			8.9	9.0
ASV			8.2	8.2			8.2	8.2			8.2	8.2

(Continued)

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Table E92 (Continued)

Prime Mover	Time, min															
	Lightweight Artillery								Medium-Weight Artillery							
	3540-lb M102				4775-lb XM204				12700-lb M114A1				15150-lb XM198			
	Wet	Snow	Wet	Snow	Wet	Snow	Wet	Snow	Wet	Snow	Wet	Snow	Wet	Snow	Wet	Snow
Mission 15 - 3.62 Miles																
M561	69.4	13.0	69.6	16.1			96.4	127.2								
M35A2	35.2	77.9	93.1	79.0			95.3	130.6								
M813			35.0	23.6	94.2	84.6	94.4	90.0	94.5	92.5	154.7	144.9				
M656			15.2	13.8			94.7	75.8								
TDW901			13.7	16.0	20.5	17.8	97.4	18.7	97.6	19.2	102.0	20.3				
M520E1			40.5	20.3			99.4	24.1			105.8	25.2				
M125E1							95.1	83.7								
M548E1			70.2	11.5			72.4	12.5			97.8	13.0				
UET							71.1	11.4			95.9	11.9				
ASV			69.7	10.3			70.7	10.7			96.2	10.8				
Mission 16 - 2.56 Miles																
M561	8.4	9.5	8.5	9.9			68.8	13.3								
M35A2	8.5	13.4	8.8	14.1			68.1	71.9								
M813			67.6	14.4	67.8	17.8	67.9	20.7	68.1	20.9	66.8	21.4				
M656			8.2	9.6			9.5	11.4								
TDW901			9.4	10.5	11.0	11.2	11.9	11.5	69.8	11.6	68.1	11.9				
M520E1			69.3	12.1			69.7	13.6			67.9	13.9				
M125E1							69.0	16.5								
M548E1			8.7	8.8			9.7	8.8			66.9	8.8				
UET							9.3	8.6			67.1	8.6				
ASV			8.2	7.9			8.8	7.9			66.7	7.9				
Mission 17 - 2.47 Miles																
M561	70.6	66.7	70.8	73.5			72.2	76.5								
M35A2	70.6	77.7	70.7	78.6			71.5	83.3								
M813			66.0	78.8	71.2	83.2	71.3	86.4	71.4	86.7	107.3	87.5				
M656			70.9	67.2			71.4	75.3								
TDW901			8.9	23.0	55.8	52.0	56.2	52.4	56.8	52.6	86.6	53.0				
M520E1			50.4	53.5			73.2	55.3			92.7	55.7				
M125E1							72.3	65.3								
M548E1			42.2	36.5			71.2	36.8			101.0	36.8				
UET							71.7	37.0			101.6	37.1				
ASV			41.9	6.8			71.0	6.9			83.4	6.9				
Mission 18 - 2.06 Miles																
M561	91.3	92.0	91.3	92.5			205.1	206.1								
M35A2	51.2	55.1	51.1	55.7			91.7	234.1								
M813			51.5	96.2	91.3	98.7	91.4	100.5	91.5	100.8	151.2	212.7				
M656			50.0	51.3			50.8	52.9								
TDW901			50.5	51.5	51.4	52.2	51.8	52.5	57.7	52.7	152.6	53.0				
M520E1			93.6	15.6			94.2	17.0			154.0	17.6				
M125E1							91.6	57.4								
M548E1			91.5	91.6			92.4	91.7			152.2	91.8				
UET							91.4	90.8			150.9	90.9				
ASV			7.9	7.4			8.7	7.5			151.0	7.6				
Mission 19 - 4.18 Miles																
M561	9.8	12.6	9.9	13.8			70.7	77.7								
M35A2	10.2	20.6	11.3	21.9			69.7	88.2								
M813			69.0	22.4	69.2	28.6	69.5	35.1	69.7	36.9	69.8	93.9				
M656			10.1	13.2			25.6	17.2								
TDW901			12.1	15.4	14.7	16.8	16.1	17.3	72.7	17.6	73.4	18.1				
M520E1			71.4	18.1			72.0	21.5			72.3	22.0				
M125E1							71.5	26.4								
M548E1			11.0	11.0			12.0	11.0			69.7	11.0				
UET							12.0	11.5			70.6	11.5				
ASV			10.4	10.2			11.0	10.3			69.4	10.3				
Mission 20 - 2.03 Miles																
M561	11.7	8.9	13.8	9.3			342.0	241.1								
M35A2	19.7	11.9	39.4	12.6			306.7	247.0								
M813			248.1	14.3	306.6	17.2	306.6	19.6	306.6	21.9	306.8	19.9				
M656			11.9	8.0			145.9	10.1								
TDW901			18.2	8.7	34.1	9.8	47.4	10.2	251.2	10.4	306.8	10.6				
M520E1			306.9	12.9			307.0	14.9			307.1	15.5				
M125E1							306.6	16.3								
M548E1			12.5	7.9			29.0	8.1			306.9	8.2				
UET							18.9	6.4			306.6	6.5				
ASV			12.7	5.0			20.7	5.1			306.7	5.2				
Mission 21 - 1.76 Miles																
M561	9.3	8.5	10.2	8.6			63.7	23.4								
M35A2	23.4	10.4	26.7	22.7			63.7	27.3								
M813			63.3	10.8	63.3	10.9	63.3	27.6	63.3	27.9	63.4	28.6				
M656			8.7	7.9			29.5	8.9								
TDW901			11.6	7.5	20.5	8.0	35.8	8.2	63.5	8.3	64.0	8.5				
M520E1			64.5	11.2			64.5	11.7			64.5	12.1				
M125E1							63.2	13.2								
M548E1			9.3	8.2			16.8	8.2			63.6	8.2				
UET							12.0	6.3			63.5	6.3				
ASV			8.4	5.2			12.3	5.2			63.2	5.2				

(Continued)

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(Sheet 3 of 6)

Table E92 (Continued)

Prime Mover	Time, min											
	Lightweight Artillery				Medium-Weight Artillery				Heavyweight Artillery			
	3340-lb M102		4775-lb XM204		12700-lb M114A1		15250-lb XM198		16590-lb XM(130-mm)		19250-lb FH70	
	Wet	Snow	Wet	Snow	Wet	Snow	Wet	Snow	Wet	Snow	Wet	Snow
Condition	Condition	Condition	Condition	Condition	Condition	Condition	Condition	Condition	Condition	Condition	Condition	Condition
Mission 22 - 2.91 Miles												
M561	23.1	74.4	80.9	85.9			308.9	260.6				
M35A2	104.7	81.7	158.7	83.1			308.7	259.0				
M813			250.0	88.3	308.6	91.7	308.6	91.2	308.6	91.5	308.6	149.4
M656			17.5	15.2			145.5	81.9				
TDW901			25.1	14.3	106.1	16.5	114.5	18.6	253.2	20.9	309.0	71.9
M520E1			309.3	23.4			309.4	33.9			309.5	81.2
M125E1							308.5	87.8				
M548E1			19.6	14.8			39.3	15.4			308.8	15.7
UET							26.2	12.5			308.6	12.7
ASV			17.3	10.2			27.2	10.6			308.5	10.8
Mission 23 - 1.82 Miles												
M561	8.0	7.0	9.2	7.3			182.7	165.1				
M35A2	11.3	10.8	15.6	11.3			147.4	171.5				
M813			146.8	12.1	146.9	14.9	147.0	16.7	147.0	20.2	147.5	170.7
M656			8.4	6.8			20.0	8.3				
TDW901			11.7	7.6	19.6	8.4	25.4	8.7	147.8	8.8	148.4	9.1
M520E1			148.4	10.1			148.6	11.9			149.0	12.3
M125E1							147.2	14.0				
M548E1			8.6	6.6			17.0	6.8			148.2	6.8
UET							11.8	5.4			147.5	5.4
ASV			8.6	4.5			12.5	4.5			147.3	4.6
Mission 24 - 3.97 Miles												
M561	10.1	12.3	10.1	13.2			71.4	20.2				
M35A2	9.5	19.6	9.6	21.3			70.2	87.5				
M813			10.1	21.6	69.5	28.5	69.7	31.9	69.8	32.5	70.1	34.0
M656			9.9	12.4			11.1	15.8				
TDW901			11.9	14.1	13.7	15.7	14.3	16.3	15.7	16.5	73.5	17.0
M520E1			72.4	17.0			73.1	19.6			73.5	20.9
M125E1							71.1	25.5				
M548E1			10.7	11.2			11.2	11.2			70.0	11.2
UET							10.8	10.8			70.1	10.8
ASV			9.5	9.9			9.9	9.9			69.1	9.9
Mission 25 - 2.53 Miles												
M561	74.8	78.4	74.8	75.0			126.2	77.4				
M35A2	71.6	71.9	74.7	72.8			125.6	79.8				
M813			125.3	77.0	125.3	79.5	125.4	80.9	125.4	81.1	125.5	81.6
M656			69.7	72.1			77.7	70.9				
TDW901			73.6	71.0	77.0	72.7	81.3	73.8	125.5	74.6	147.8	77.2
M520E1			131.6	78.5			127.8	79.9			141.2	85.7
M125E1							125.1	76.9				
M548E1			70.1	13.9			75.6	15.4			129.5	15.7
UET							71.2	11.7			127.6	11.9
ASV			68.0	9.5			71.1	9.9			127.2	10.1
Mission 26 - 1.88 Miles												
M561	51.4	50.1	52.3	50.3			178.8	237.5				
M35A2	54.8	53.1	61.9	53.7			178.0	293.4				
M813			147.5	54.8	147.9	86.9	148.3	89.1	148.7	89.5	148.3	89.9
M656			51.2	50.2			145.2	51.7				
TDW901			54.6	50.7	62.5	51.5	68.8	51.9	148.7	52.1	149.3	52.4
M520E1			149.3	14.5			149.8	16.2			150.4	16.8
M125E1							148.0	56.9				
M548E1			81.9	49.7			89.7	49.8			149.0	49.9
UET							84.6	48.4			148.2	48.6
ASV			10.4	6.2			14.2	6.3			148.3	6.4
Mission 27 - 2.67 Miles												
M561	67.5	11.9	68.0				174.1	185.2				
M35A2	110.9	72.7	119.8	73.6			113.8	187.6				
M813			112.9	74.4	113.5	136.4	113.7	139.8	113.7	140.8	173.2	182.3
M656			67.8	11.0			107.9	71.2				
TDW901			13.2	12.5	81.7	14.5	118.5	15.7	115.8	16.6	200.2	19.5
M520E1			115.1	16.4			116.1	19.7			175.6	26.7
M125E1							114.6	77.1				
M548E1			68.4	9.1			72.6	10.0			177.1	10.2
UET							70.0	9.5			175.7	9.7
ASV			68.0	8.3			69.9	8.6			175.3	8.8
Mission 28 - 3.20 Miles												
M561	12.2	13.2	12.7	13.6			68.6	71.4				
M35A2	69.2	14.9	69.2	21.3			70.2	75.5				
M813			70.8	16.9	70.9	78.1	71.0	80.5	71.1	83.0	112.7	78.0
M656			11.0	12.2			70.1	14.1				
TDW901			11.9	12.7	15.0	13.4	71.1	13.7	71.3	13.8	113.2	14.2
M520E1			72.1	15.6			72.3	17.4			113.9	17.6
M125E1							71.2	18.8				
M548E1			11.7	11.4			13.2	11.5			112.2	11.7
UET							11.7	10.8			111.6	10.8
ASV			10.2	9.8			11.1	10.1			111.1	10.1

(Continued)

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Table E92 (Continued)

Prime Mover	Time, min													
	Lightweight Artillery				Medium-Weight Artillery								Heavyweight Artillery	
	3340-lb		4775-lb		12700-lb		15250-lb		16500-lb				19250-lb	
	M102		XM204		M114A1		XM198		XM(130-mm)				PH70	
	Wet	Snow	Wet	Snow	Wet	Snow	Wet	Snow	Wet	Snow	Wet	Snow	Wet	Snow
Condition	Condition	Condition	Condition	Condition	Condition	Condition	Condition	Condition	Condition	Condition	Condition	Condition	Condition	Condition
<u>Mission 29 - 2.49 Miles</u>														
M561	69.6	69.9	123.0	70.4			258.9	188.8						
M35A2	69.2	73.9	87.8	128.0			257.0	195.5						
M813	204.0	76.6			204.7	133.3	205.8	135.7	206.9	136.2	205.1	154.7		
M656			70.1	68.6			142.4	71.2						
TDM901			72.8	69.3	73.2	70.5	75.5	71.0	205.2	71.2	206.7	71.6		
M520E1			206.9	73.2			207.7	75.4			208.2	76.3		
M125E1							204.5	78.7						
M548E1			71.8	63.9			73.1	66.5			205.5	65.6		
UET							77.4	63.5			204.8	63.8		
ASV			17.0	10.7			24.8	11.9			181.5	12.7		
<u>Mission 30 - 3.35 Miles</u>														
M561	10.3	11.7	10.5	12.2			34.7	85.6						
M35A2	27.8	15.0	27.9	15.6			34.4	89.9						
M813			33.8	15.8	34.0	18.4	34.1	22.2	34.3	74.8	88.0	76.1		
M656			10.3	12.0			28.4	13.8						
TDM901			11.3	13.0	29.8	13.5	30.0	13.7	35.9	13.8	89.6	14.1		
M520E1			35.4	13.9			35.6	15.5			89.1	15.6		
M125E1							34.9	17.5						
M548E1			10.6	11.2			11.3	11.3			88.0	11.3		
UET							10.9	11.3			88.0	11.3		
ASV			10.2	10.8			10.5	10.9			87.5	10.9		
<u>Mission 31 - 3.65 Miles</u>														
M561	71.1	12.5	72.3	72.6			301.2	252.1						
M35A2	132.2	78.4	141.4	80.2			301.8	261.1						
M813			240.7	80.6	241.2	91.2	241.6	150.8	241.9	151.3	304.5	160.4		
M656			71.2	12.5			190.7	75.7						
TDM901			16.8	14.4	89.7	16.5	142.9	17.7	244.6	18.4	320.5	20.2		
M520E1			244.5	19.9			245.6	23.5			306.6	27.7		
M125E1							242.9	85.1						
M548E1			73.2	11.1			80.2	11.7			306.0	11.9		
UET							75.2	10.3			305.5	10.3		
ASV			71.1	8.7			75.1	9.0			305.1	9.1		
<u>Mission 32 - 2.32 Miles</u>														
M561	14.4	14.5	14.9	15.0			128.1	189.6						
M35A2	14.9	16.3	18.5	73.5			124.5	193.1						
M813			123.7	20.4	124.2	79.1	124.3	81.0	124.3	81.5	124.8	82.4		
M656			12.0	11.6			25.5	16.1						
TDM901			15.5	11.8	23.7	13.2	30.3	14.5	125.2	14.9	126.2	15.2		
M520E1			125.7	18.5			126.2	20.8			127.1	22.0		
M125E1							124.4	25.7						
M548E1			13.7	11.0			22.9	12.0			125.3	11.9		
UET							16.3	9.9			125.0	10.0		
ASV			12.5	9.1			17.4	9.5			124.8	9.6		
<u>Mission 33 - 2.84 Miles</u>														
M561	43.2	103.9	43.2	105.0			47.1	252.5						
M35A2	42.9	108.9	43.3	109.6			45.3	252.5						
M813			43.5	111.3	44.8	113.6	45.2	116.8	45.3	117.1	45.6	173.2		
M656			43.7	104.9			45.1	107.6						
TDM901			46.6	49.2	48.1	107.9	48.6	108.4	48.8	108.6	49.3	109.0		
M520E1			47.5	51.3			50.0	112.5			50.9	113.3		
M125E1							46.5	113.8						
M548E1			11.8	25.7			46.4	44.6			46.7	45.3		
UET							45.3	44.4			45.4	45.0		
ASV			9.5	43.5			44.5	44.0			44.9	44.3		
<u>Mission 34 - 3.24 Miles</u>														
M561	71.3	71.9	71.8	72.7			235.7	185.5						
M35A2	69.9	77.9	70.7	128.7			176.5	192.7						
M813			176.1	79.4	175.9	134.4	176.3	136.8	176.4	137.3	240.5	139.7		
M656			71.0	71.8			72.4	75.7						
TDM901			73.3	72.7	82.0	74.4	75.4	75.3	178.5	75.6	241.6	76.3		
M520E1			179.8	78.4			179.6	81.1			243.0	81.7		
M125E1							178.9	86.7						
M548E1			71.9	12.0			76.3	13.6			240.2	13.8		
UET							73.3	11.4			240.1	11.5		
ASV			69.9	9.7			72.3	10.4						
<u>Mission 35 - 3.21 Miles</u>														
M561	15.0	16.3	15.2	76.0			127.0	240.1						
M35A2	9.9	76.4	11.1	77.8			41.6	294.5						
M813			37.7	81.3	38.6	86.9	38.8	85.4	38.8	85.9	74.0	89.0		
M656			11.0	12.8			35.9	74.7						
TDM901			12.0	13.5	14.0	15.3	14.9	16.2	37.9	16.7	73.2	17.9		
M520E1			40.3	19.7			41.9	22.7			76.8	24.1		
M125E1							37.7	83.3						
M548E1			11.9	11.3			13.1	11.9			71.9	12.0		
UET											70.4	10.5		
ASV			9.8	9.0			10.8	9.2			69.3	9.4		

(Continued)

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Table E92 (Concluded)

Prime Mover	Time, min											
	Lightweight Artillery				Medium-Weight Artillery				Heavyweight Artillery			
	3340-1b		4775-1b		12700-1b		15250-1b		16590-1b		19250-1b	
	M102		XM204		M114A1		XM198		XM(130-mm)		FH70	
	Wet	Snow	Wet	Snow	Wet	Snow	Wet	Snow	Wet	Snow	Wet	Snow
Mission 36 - 2.53 Miles												
MS61	14.2	15.2	14.3	15.8			107.8	215.3				
M35A2	8.6	14.0	11.3	14.9			50.6	216.7				
M813			54.7	19.5	55.3	22.9	55.4	65.9	55.5	66.2	55.6	93.2
M656			9.6	10.9			51.7	13.3				
TOW901			10.1	11.1	11.9	12.3	12.9	12.7	52.7	12.9	53.4	13.3
MS20E1			55.8	16.6			56.8	19.4			57.3	20.2
M125E1							53.8	20.2				
MS48E1			9.8	9.6			11.3	9.9			52.4	10.0
UET							9.7	9.0			51.2	9.1
ASV			7.6	7.2			8.5	7.4			50.3	7.5
Mission 37 - 2.91 Miles												
MS61	53.3	53.1	57.1	56.4			198.3	193.5				
M35A2	70.6	73.6	74.4	76.7			188.5	196.6				
M813			190.8	79.7	191.4	83.7	191.5	87.0	191.6	87.5	191.9	90.0
M656			70.1	69.8			77.6	73.8				
TOW901			73.2	71.4	78.5	72.6	81.8	73.0	189.4	73.2	190.9	73.6
MS20E1			192.6	77.6			193.6	79.4			194.6	80.2
M125E1							190.6	80.8				
MS48E1			39.6	38.0			57.6	50.8			170.5	50.8
UET							61.6	57.3			157.6	37.8
ASV			46.4	43.5			43.0	50.7			171.2	50.7

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Table E93

Time (min.) for Study Self-Propelled and Reference Vehicle to Complete Selected Artillery Missions

Mission No.	Length lb	Self-Propelled Artillery			Reference Vehicles									
		M109A1	M107	M110E2	M113A1	M60A2	M548E1	M577A1	XM723	XM1	ASV	M561	M813	UTV
Wet Condition														
1	2.06	6.5	6.5	6.5	5.1	6.2	5.5	5.2	5.0	4.6	5.3	5.2	58.9	5.8
2	1.60	14.7	14.5	14.5	13.9	13.1	15.1	13.9	12.1	12.1	12.5	9.5	168.2	13.3
3	3.07	13.4	12.9	12.9	50.0	11.4	51.4	50.2	7.7	8.0	8.9	51.4	125.5	9.8
4	2.80	11.1	10.8	10.8	8.2	9.8	9.7	8.3	7.8	7.3	8.7	8.3	183.9	9.0
5	2.72	50.1	50.0	50.0	47.6	48.7	49.7	47.9	46.4	10.6	47.1	49.2	130.1	47.7
6	2.52	13.3	12.8	12.8	8.7	10.6	10.0	8.9	7.9	8.2	9.1	9.8	65.6	9.8
7	2.31	10.6	10.4	10.4	7.1	8.4	8.3	7.2	6.1	6.2	7.2	7.8	123.3	7.8
8	3.07	9.0	9.0	9.0	8.2	9.3	8.9	8.2	8.0	7.7	8.1	8.4	8.0	8.9
9	2.25	17.7	17.6	17.6	14.5	16.1	16.1	14.6	14.0	13.7	14.8	9.6	65.7	15.4
10	2.50	12.3	11.7	11.7	63.1	14.9	63.6	63.2	62.8	10.1	63.1	10.6	71.1	63.6
11	2.80	69.3	69.2	69.2	66.9	68.5	67.7	67.0	66.8	66.1	67.5	7.9	163.2	67.9
12	1.64	10.5	10.2	10.2	7.2	50.6	8.7	7.8	9.7	47.5	8.4	6.4	65.8	7.8
13	2.11	7.9	66.3	8.0	65.9	66.2	66.2	66.0	7.3	7.0	7.4	66.0	107.6	66.2
14	2.94	9.0	9.0	9.0	8.3	9.2	8.4	8.3	8.2	8.0	8.2	7.7	7.8	9.0
15	3.62	70.5	70.5	70.5	68.9	70.3	69.6	68.9	68.6	67.8	69.2	9.8	33.6	69.8
16	2.56	8.8	8.7	8.7	8.0	8.7	8.6	8.0	7.7	7.5	7.8	8.2	67.5	8.4
17	2.47	42.8	42.7	42.7	41.7	42.9	41.8	41.7	41.5	41.3	41.6	35.1	64.8	42.3
18	2.06	8.5	8.6	8.6	49.9	9.7	91.3	49.9	7.3	6.8	7.6	91.1	50.6	49.2
19	4.18	11.7	11.7	11.7	10.2	11.8	10.7	10.2	10.1	9.7	10.2	9.6	68.9	11.3
20	2.03	12.5	12.1	12.1	7.3	9.5	8.6	7.5	6.4	6.4	7.8	8.6	247.7	8.2
21	1.76	9.2	8.9	8.9	6.8	7.1	8.2	6.8	5.5	5.8	6.1	8.4	63.3	6.9
22	2.91	17.8	17.1	17.1	13.5	14.2	15.7	13.7	11.0	11.0	12.6	19.8	249.7	13.4
23	1.82	8.7	8.6	8.6	5.6	7.0	6.7	5.7	5.2	5.2	6.0	6.5	146.7	6.5
24	3.97	10.7	10.7	10.7	9.3	11.1	10.5	9.3	9.2	9.0	9.2	9.9	9.5	10.4
25	2.53	69.2	69.1	69.1	68.4	67.5	69.9	68.4	66.1	66.5	66.5	78.1	128.4	67.8
26	1.88	10.6	10.3	10.3	38.6	10.3	80.2	38.7	7.6	7.7	8.2	49.9	147.4	79.5
27	2.67	68.5	68.4	68.4	66.7	67.9	67.2	66.7	66.4	65.9	67.0	10.1	110.2	67.3
28	3.20	11.1	11.0	11.0	10.2	10.6	11.2	10.2	9.6	9.3	9.8	12.0	70.7	10.6
29	2.49	70.0	69.4	69.4	121.9	20.3	123.1	122.0	67.5	14.0	68.2	69.4	147.1	121.3
30	3.35	10.7	10.7	10.7	10.0	10.7	10.5	10.1	10.0	9.8	10.1	10.2	33.8	10.6
31	3.65	72.6	72.4	72.4	69.6	71.7	71.6	69.7	68.6	68.2	69.4	10.3	183.1	70.8
32	2.32	13.0	12.7	12.7	10.0	10.8	11.7	10.2	10.0	8.2	10.1	13.2	71.9	10.2
33	2.84	9.9	9.6	9.6	7.6	9.4	8.3	7.8	7.3	8.6	8.1	6.9	42.7	8.5
34	3.24	71.1	71.0	71.0	69.0	70.2	70.7	69.1	68.6	67.5	68.8	70.1	123.1	69.5
35	3.21	11.2	11.2	11.2	10.1	11.1	11.7	10.2	9.0	8.6	9.5	14.3	37.4	11.0
36	2.53	8.4	8.4	8.4	8.5	8.5	9.4	8.5	6.9	6.9	7.2	13.5	54.3	8.7
37	2.91	58.2	61.2	61.2	31.2	25.4	30.2	32.0	32.8	68.3	55.6	62.1	190.7	38.6
Snow Condition														
1	2.06	6.1	6.1	6.1	5.5	6.2	6.0	5.5	5.5	5.4	5.6	6.5	11.0	5.9
2	1.60	7.3	7.3	7.3	7.6	6.5	9.0	7.6	6.0	5.8	6.0	9.9	11.5	6.9
3	3.07	9.8	9.8	9.8	50.1	9.1	51.8	50.1	7.4	7.0	7.4	52.0	17.9	8.7
4	2.80	8.6	8.7	8.7	7.7	8.3	9.0	7.7	7.0	6.5	7.3	9.5	16.8	8.1
5	2.72	48.2	48.2	48.2	47.7	47.4	49.6	47.7	46.4	45.7	46.4	50.3	54.1	47.3
6	2.52	9.4	9.4	9.4	8.4	7.9	10.1	8.4	7.1	6.6	7.2	10.3	14.6	8.2
7	2.31	7.5	7.6	7.6	6.5	6.0	7.9	6.5	5.2	4.7	5.2	8.3	12.7	6.4
8	3.07	9.5	9.5	9.5	8.7	9.7	9.3	8.7	8.7	8.6	8.7	9.5	16.2	9.3
9	2.25	8.9	8.9	8.9	8.0	8.2	9.6	8.1	6.9	6.8	7.1	9.8	14.4	7.9
10	2.50	10.5	10.5	10.5	10.2	10.8	10.8	10.2	9.8	9.9	9.7	11.5	15.6	10.4
11	2.80	8.5	8.5	8.5	7.6	8.3	8.6	7.6	7.3	6.8	7.7	9.4	17.6	8.1
12	1.64	5.8	5.8	5.8	5.0	47.0	6.4	5.0	5.2	45.5	4.9	6.3	10.7	5.1
13	2.11	8.0	66.4	8.0	66.2	66.4	66.5	66.2	7.7	7.4	7.8	66.5	68.4	66.4
14	2.94	9.0	9.0	9.0	8.3	9.2	8.5	8.3	8.2	8.0	8.2	9.1	15.4	8.9
15	3.62	11.6	11.6	11.6	10.1	11.0	11.4	10.1	9.5	8.9	10.0	12.1	21.0	10.4
16	2.56	8.6	8.7	8.7	8.2	8.7	8.8	8.2	7.8	7.7	7.9	9.2	13.8	8.5
17	2.47	7.5	7.5	7.5	36.2	8.5	36.4	36.3	6.7	6.5	6.7	40.5	72.7	7.2
18	2.06	8.2	8.2	8.3	49.9	9.4	91.5	49.9	7.1	6.7	7.2	91.7	55.2	49.0
19	4.18	11.6	11.6	11.6	10.5	11.8	10.9	10.5	10.2	9.9	10.2	11.9	21.9	11.4
20	2.03	7.5	7.5	7.5	6.3	5.7	7.9	6.3	4.9	4.0	4.9	8.7	12.4	6.1
21	1.76	6.9	6.9	6.9	6.7	5.9	8.2	6.7	5.2	5.1	5.2	8.4	10.1	6.3
22	2.91	12.2	12.3	12.3	12.3	11.2	14.5	12.3	9.7	9.2	10.1	20.1	23.8	11.8
23	1.82	6.0	6.0	6.0	5.3	5.1	6.6	5.3	4.4	4.0	4.4	6.7	10.0	5.3
24	3.97	11.0	11.0	11.0	10.0	11.2	11.1	10.0	9.9	9.8	9.9	11.2	20.8	10.8
25	2.53	11.0	11.0	11.0	11.4	10.1	13.5	11.5	8.8	8.6	9.3	78.3	79.8	11.3
26	1.88	7.4	7.5	7.5	7.6	7.9	49.6	7.5	6.0	5.9	6.1	49.9	53.0	48.1
27	2.67	9.1	9.2	9.2	8.2	8.8	8.8	8.2	7.7	7.2	8.2	11.2	17.4	8.7
28	3.20	10.1	10.7	10.7	10.5	10.5	11.4	10.5	9.6	9.6	9.8	12.7	16.7	10.6
29	2.49	61.7	61.7	61.7	62.0	10.0	63.7	62.1	7.6	7.9	9.9	69.1	75.3	63.5
30	3.35	11.3	11.3	11.3	10.8	11.4	11.2	10.8	10.8	10.7	10.8	11.4	15.7	11.3
31	3.65	10.8	10.8	10.8	9.2	10.0	10.8	9.2	8.4	7.5	8.6	11.5	21.2	9.8
32	2.32	10.1	10.0	10.0	9.4	9.1	10.9	9.4	9.0	7.9	8.9	13.6	19.0	9.3
33	2.84	44.4	44.4	44.4	14.0	44.0	19.1	18.8	42.8	42.2	43.2	44.3	110.2	43.3
34	3.24	11.3	11.3	11.3	10.0	10.3	11.7	10.1	9.0	7.9	9.4	70.7	78.2	10.2
35	3.21	10.0	10.1	10.1	9.9	10.1	11.2	9.9	8.6	8.8	8.8	15.6	21.5	10.0
36	2.53	8.1	8.1	8.1	8.6	8.3	9.4	8.6	7.1	7.4	7.2	14.6	18.9	8.5
37	2.91	56.2	59.4	59.4	30.9	23.6	30.2	31.6	32.0	67.2	54.2	62.7	79.2	37.4

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**APPENDIX F: SELECTION OF TACTICAL HIGH AS MOBILITY
LEVEL FOR COMPARING STUDY VEHICLES**

1. The percentages of primary and secondary roads, trails, and off-road terrain that make up the network for the 37 missions related to artillery movement (Table 3) were compared to the percentages of operating distance for tactical high mobility (Table 18) with the following results:

	<u>Mission Network Composite Percentage</u>			
	<u>Primary Road</u>	<u>Secondary Road</u>	<u>Trails</u>	<u>Off-Road</u>
Artillery missions	15	33	42	10
Tactical high mobility level	10	32	8	50

2. The values of 10, 32, and 8 were obtained by taking 50 percent of the values shown for primary roads, secondary roads, and trails from the HIMO network shown in Table 3. The comparison above shows that the artillery missions have about the same percentage of trails and off-road combined ($42 + 10$) as the tactical high mobility level ($50 + 8$) but the artillery missions have a much larger percentage of trails than does the tactical high mobility levels.

3. To show that the tactical high mobility level was adequate for describing the mobility performance for artillery-related missions, a preliminary definition of "tactical artillery mobility" was defined as follows:

- a. 20 percent of primary roads at V_{100}
- b. 20 percent of secondary roads at V_{100}
- c. 40 percent of trails at V_{100}
- d. 20 percent of off-road at V_{90}

The equations given in Appendix G were then used to determine a tactical artillery mobility rating speed based on the preliminary definitions of "tactical artillery mobility" given above. Tactical artillery

mobility rating speeds and the tactical high mobility rating speeds for several study vehicles for the wet condition in West Germany are given below.

<u>Study Vehicle</u>	<u>Tactical Artillery Mobility Rating Speed, mph</u>	<u>Tactical High Mobility Rating Speed, mph</u>
M109A1	13.0	10.1
ASV-XM204	14.2	10.7
TDW901-XM204	12.0	9.3
M561-XM204	4.3	3.1
M548-XM204	7.4	4.3
ASV-XM198	12.9	9.8
TDW901-XM198	10.4	8.2
M656-XM198	4.9	3.9
M548-XM198	7.1	4.3
ASV-FH70	0.1	0.1
TDW901-FH70	0.1	0.1
M520-FH70	0.1	0.1
M548-FH70	0.1	0.1

4. The differences in speed show that the tactical high mobility level is slightly more severe than the tactical artillery mobility level. However, it is felt that the difference in performance between tactical high mobility and tactical artillery mobility do not warrant establishing a tactical artillery mobility definition at this time. Therefore, it is recommended that the tactical high mobility level be used to determine the relative mobility of artillery vehicles until sufficient data are available to more completely define the tactical artillery mobility definition.

APPENDIX G: COMPUTATION OF MISSION-ORIENTED AVERAGE SPEED BASED
ON STATISTICAL MISSION DEFINITION AND VEHICLE PERFORMANCE
STATISTICS FOR AN AREA AND CONDITION

1. The equation for computing the mobility rating speeds from the HIMO report is given as follows:

$$V_w = \frac{100}{\frac{P}{V_C} \left(1 + \frac{L}{100}\right) + \frac{100 - P}{V_R}}$$

where

- V_w = mobility rating speed, mph, for a vehicle performing a mission for a specific area and condition.
- P = the percentage of expected off-road operating distance.
- V_C = the speed from the off-road profile, mph, corresponding to C.
- C = the percentage of the off-road terrain that should be negotiable.
- L = the percentage of the total time over the route network considered as an off-road traverse, that is spend in negotiating linear features. (This figure is available from the link statistics for each vehicle, area, and condition.)
- V_R = the speed from the on-road speed profile, mph, corresponding to R.
- R = the percentage of the road and trail network that should be negotiable.

2. The speed from the on-road profile, V_R , is not directly available from this study, but can be computed using the speeds from the profiles of the primary and secondary roads and trails as follows:

$$V_R = \frac{100 - P}{\frac{P_P}{V_{PP}} + \frac{P_S}{V_{SP}} + \frac{P_T}{V_{TP}}}$$

where:

P_P, P_S, P_T = percentages of the composite on-road and off-road network that are primary roads, secondary roads, and trails, respectively.

V_{PP}, V_{SP}, V_{TP} = the speeds from the primary road, secondary road, and trail speed profiles respectively, mph, that correspond to R.